United Nations A/64/305

General Assembly

Distr.: General
17 August 2009

Original: English

Sixty-fourth session
Item 78 (b) of the provisional agenda*
Oceans and the law of the sea: sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments

Actions taken by States and regional fisheries management organizations and arrangements to give effect to paragraphs 83 to 90 of General Assembly resolution 61/105 on sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments

Report of the Secretary-General

Summary

The present report is prepared pursuant to General Assembly resolution 61/105, paragraphs 80 and 90, in which the General Assembly requested States and regional fisheries management organizations and arrangements (RFMO/As) to sustainably manage fisheries, regulate bottom fisheries and protect vulnerable marine ecosystems (VMEs). Notably, in paragraph 91 of the resolution, the Assembly requested the Secretary-General, in cooperation with the Food and Agriculture Organization of the United Nations (FAO), to include in his report concerning fisheries to the General Assembly at its sixty-fourth session a section on the actions taken by States and RFMO/As in response to paragraphs 83 to 90 of the resolution.

* A/64/150.

09-48472 (E) 091009

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The report describes the most vulnerable marine ecosystems and the impacts of bottom fishing on such ecosystems and outlines actions taken by States and RFMO/As to adopt and implement measures aimed at regulating bottom fisheries and protecting VMEs from destructive fishing practices. Furthermore, it describes recent initiatives by States to establish new RFMO/As in the north-west and south Pacific with the competence to regulate bottom fisheries and interim measures adopted by these States pending the establishment of such organizations or arrangements.

The report is a follow-up to the report of the Secretary-General entitled "Impacts of fishing on vulnerable marine ecosystems: actions taken by States and regional fisheries management organizations and arrangements to give effect to paragraphs 66 to 69 of the General Assembly resolution 59/25 on sustainable fisheries, regarding the impacts of fishing on vulnerable marine ecosystems" (A/61/154). It should be read in conjunction with earlier interim reports of the Secretary-General on the measures taken by States and RFMO/As to implement resolution 61/105 (A/62/260, paras. 60-96 and A/63/128, paras. 63-78).

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Abbreviations

BPA	Benthic protected area
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
COFI	FAO Committee on Fisheries
EC	European Community
EEZ	Exclusive economic zone
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFA	South Pacific Forum Fisheries Agency
FIRMS	Fishery Resources Monitoring System
GFCM	General Fisheries Commission for the Mediterranean
HERMES	Hotspot Ecosystems Research on the Margins of European Seas
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IUU fishing	Illegal, unreported and unregulated fishing
MPA	Marine protected area
NAFO	Northwest Atlantic Fisheries Organization
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	North East Atlantic Fisheries Commission
NGO	Non-governmental organization
NWPO	Management of High Seas Bottom Fisheries in the North Western Pacific Ocean
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PECMAS	Permanent Committee on Management and Science
RFMO/A	Regional fisheries management organization and arrangement

SEAFO	South East Atlantic Fisheries Organization
SIODFA	Southern Indian Ocean Deepwater Fisheries Association
SIOFA	South Indian Ocean Fisheries Agreement
SPC	Secretariat of the Pacific Community
SPRFMO	South Pacific Regional Fisheries Management Organization
VME	Vulnerable marine ecosystem
VMS	Vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission

I. Introduction

1. At its sixty-first session, the General Assembly adopted resolution 61/105, paragraphs 80 to 91 of which relate to the preparation of the present report. The Assembly, inter alia, welcomed the important progress made by States and regional fisheries management organizations and arrangements (RFMO/As) with the competence to regulate bottom fisheries to give effect to the relevant provisions of its resolution 59/25 to address the impact of fishing on vulnerable marine ecosystems (VMEs), and called upon States to take action immediately, individually and through RFMO/As, to sustainably manage fish stocks and protect VMEs from destructive fishing practices.

2. The General Assembly also called upon RFMO/As with the competence to regulate bottom fisheries to adopt and implement conservation and management measures, in accordance with the precautionary approach, ecosystems approaches and international law, as a matter of priority, but not later than 31 December 2008, to regulate bottom fishing activities and protect VMEs.

3. Furthermore, the General Assembly called upon States participating in negotiations to establish a RFMO/A competent to regulate bottom fisheries to expedite their negotiations and, by no later than 31 December 2007, to adopt and implement interim measures, consistent with the resolution, to regulate bottom fishing activities and protect VMEs.

4. In addition, the General Assembly called upon flag States to either adopt and implement measures to regulate bottom fisheries and protect VMEs or cease to authorize fishing vessels flying their flag to conduct bottom fisheries in areas beyond national jurisdiction where there was no RFMO/A with the competence to regulate bottom fisheries or interim measures in force, until conservation and management measures or interim measures to regulate bottom fisheries and protect VMEs, consistent with the resolution, were adopted for such areas. The Assembly also required that all measures adopted by States and RFMO/As pursuant to the resolution be made publicly available.

5. Lastly, the General Assembly requested the Secretary-General to provide to it at its sixty-fourth session a report on the actions taken by States and RFMO/As in response to paragraphs 83 to 90 of the resolution, to allow it to conduct a further review of such actions at that session, with a view to further recommendations, where necessary.

6. Following the adoption of General Assembly resolution 63/112, by which the Assembly also requested the Secretary-General, as in paragraph 91 of resolution 61/105, to report on actions taken to give effect to paragraphs 83 to 90 of resolution 61/105, the Secretary-General circulated a questionnaire to States and RFMO/As inviting them to submit detailed information on actions they had taken to implement the latter with a view to facilitating a further review of such actions. Information was also requested from the Food and Agriculture Organization of the United Nations (FAO), other relevant intergovernmental organizations and non-governmental organizations (NGOs).

7. In response, submissions were received from 29 States, the European Community (EC), 11 RFMO/As and FAO, as well as from intergovernmental organizations and NGOs (see annex). The report is based on the information

provided by States and RFMO/As, and other relevant information. The Secretary-General wishes to express his appreciation for these submissions.

II. Vulnerable marine ecosystems and bottom fishing activities

8. Earlier reports of the Secretary-General have provided detailed descriptions of VMEs, in particular, VMEs in the deep-sea beyond the limits of national jurisdiction (see, for example, A/58/65, A/59/62, A/60/63/Add.1 and A/61/154).

9. VMEs are identified by the vulnerabilities of their components and are defined by those vulnerable components. Vulnerability is related to the likelihood that a population, community, or habitat will experience substantial alteration due to short-term or chronic disturbance, and the likelihood that it will recover, and in what time frame. These are, in turn, related to the characteristics of the ecosystems themselves, especially biological and structural aspects. VME features may be physically or functionally fragile. The most vulnerable ecosystems are those that are both easily disturbed and very slow to recover, or may never recover.[1] The related concept of sensitive habitats has recently been defined as those habitats that are easily adversely affected by human activity, and/or those where an affected area is expected to recover only over a very long period, or not at all.[2]

10. The vulnerability of populations, communities and habitats must be assessed relative to specific threats. Some features, particularly those that are physically fragile or inherently rare, may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced.[1] The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat.[3]

A. Vulnerable marine ecosystems: an updated review

11. All ecosystems are hierarchical, with each lower level containing smaller and less heterogeneous units within it, yet none of the units are truly homogeneous or exist without external linkages to other units. Within such hierarchies, the examples of VMEs identified in General Assembly resolution 61/105 (i.e., seamounts, hydrothermal vents and cold-water corals)[4] approximate, in technical terms, to ecotopes which are the finest scale units used in mapping ecosystems. Such VMEs may be expected to occur as numerous, small patches, scattered among larger areas of larger ecosystems. There is no absolute standard for how finely these hierarchies of systems should be divided and RFMO/As must choose appropriate spatial and ecological scales. Too fine a division would impose severe management costs in mapping ecosystems and in

[1] *Report of the Technical Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas, Rome, 4-8 February and 25-29 August 2008*, FAO Fisheries and Aquaculture Report No. 881.

[2] International Council for Exploration of the Sea (ICES), Report of the Working Group on Deep-water Ecology, Copenhagen, 8-11 March 2005.

[3] Ibid.

[4] Seamounts are bathymetric features, hydrothermal vents are geological features and corals are organisms. Those examples can be seen as convenient labels for the ecosystems characteristic of seamounts and the areas around vents, plus those ecosystems characterized by cold-water corals.

enforcing any spatially specific management measures. However, too coarse a division would risk applying management measures broadly, including not applying them in areas where they are required, or applying them in areas where they are not required. It would also risk lowering the perceived vulnerability of ecosystems by averaging across small patches with highly vulnerable components and larger areas with only low vulnerability, perhaps eliminating VME status where it is merited and thus failing to focus attention where it is most needed.[5]

12. While no marine ecosystem is fully independent of others, each contains its own major energy sources. Except for those associated with hydrothermal vents, which provide energy at depth, all deep-sea ecosystems are powered by primary production in the overlying, sunlit photic zone. Most deep-sea ecosystems, therefore, include the whole water column from seabed to surface. Because of the mobility of the overlying waters, in many cases, a small patch of deep seabed will be connected to a much larger area of the near-surface layers, making benthic organisms potentially vulnerable to extensive human activities in the surface layers. On the other hand, the mobility of the overlying waters could buffer benthic organisms from the consequences of intense, local activity near the surface.[5]

1. Seamounts

13. Seamounts are undersea mountains of tectonic and/or volcanic origin. They are ubiquitous features of the world's underwater topography and may play an important role in patterns of marine biogeography, potentially supporting high biodiversity and unique biological communities. They are both numerous and highly variable, ranging from isolated submarine volcanic peaks to small knolls on mid-ocean ridges. The larger ones can support multiple, different ecosystems, such as a relatively shallow, flat and muddy plateau on their peaks, flanked by steep, rocky slopes bearing very different benthic communities.

14. Seamounts are often highly productive ecosystems and may act as feeding grounds for fish, marine mammals and seabirds, although the mechanisms by which the features affect water flows and thus generate the enhanced productivity remain unclear. They may act as biological hot spots in the oceans and often attract a high abundance and diversity of large predators, such as sharks, tuna, billfish, turtles, seabirds and marine mammals. Almost every seamount that has been sampled has revealed markedly high levels of new species. Seamount communities are distinct from the surrounding deep-sea fauna and, therefore, are highly endemic.[6]

15. Seamounts themselves are large masses of rock and their basic bathymetry is not particularly vulnerable to the impacts of fishing. Seamount ecosystems may nevertheless be highly vulnerable to disturbance because of the coral "forests" and large sponges which can be abundant on the flanks of the bathymetric features. The vulnerability of seamount ecosystems is thus largely the same as the vulnerability of other coral and sponge ecosystems. While the ecological roles of corals and sponges on seamounts are little different to their roles in other areas, the value of seamount ecosystems may be higher because of the "biodiversity" and endemism.[7]

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[5] FAO Fisheries Report No. 829.

[6] G. Menezes, "Demersal fish assemblages in the Atlantic archipelagos of the Azorees, Madeira and Cape Verde", Ph.D. thesis, Department of Oceanography and Fisheries (University of the Azores, Portugal, 2003).

[7] http://pacific.sdsc.edu/seamounts/. An online information system for seamount biology.

16. Several seamounts have been identified in the Pacific and Atlantic Oceans, but only a few in the Indian Ocean. They have been targeted for resource extraction such as fisheries and mining, but are ecologically vulnerable to such exploitation. At a global scale, their biodiversity is poorly known with relatively few (less than 200 of an estimated 100,000) seamounts having been studied in any detail. Any estimates in terms of the number of species is likely to be conservative because of the limited numbers of samples and limitations of sampling gear.[8]

17. The lack of affinity between seamount communities across only 1,000 kilometres of ocean is remarkable, and indicates that seamount species may be restricted in their distribution to single clusters or chains of seamounts or even to single seamounts. This means that human impacts on seamounts resulting from fishing or mining may result in species extinction and a global reduction in the diversity of the global seamount fauna. There is, therefore, an urgent requirement to assess the distribution of biogenic structures and associated communities on seamounts to identify which areas harbour significant species diversity.[9]

2. Hydrothermal vents

18. Hydrothermal vents are rare features, surrounded by small, distinctive ecosystems supported by a chemosynthetic source unknown elsewhere in the marine biosphere. They occur at divergent plate boundaries (mid-ocean ridges) and convergent plates where back-arc spreading centres occur. At mid-ocean ridges, interaction among the liquid magma from the Earth's mantel, gases and water at extreme pressures create high-temperature deep-sea vents rich in chemicals that feed bacteria at the base of unique food chains. An investigation of the biogeographic value of chemosynthetic systems has revealed that vents are like oases in the deep, supporting life and spreading species richness. The biological processes occurring at hydrothermal vents are powered by chemical energy rather than sunlight.[10] In view of the peculiar circumstances in which life develops in these ecosystems, hydrothermal vent organisms are a subject of interest from both a scientific and a commercial point of view.

19. The main characteristic of hydrothermal species is their tolerance to extreme conditions and their very peculiar physiology. Organisms mostly belong to the domain archaea, an evolutionary branch that is separate from those of bacteria and eukarya. The biomass of benthic animals at these habitats is typically high and dominated by tubeworms (*Riftia pachyptila*), clams (*Calyptogena magnifica*),

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[8] National Research Council, *Effects of Trawling & Dredging on Seafloor Habitat. Committee on Ecosystem Effects of Fishing: Phase 1 — Effects of Bottom Trawling on Seafloor Habitats* (Washington, D.C., National Academy Press, 2002).

[9] B. Richer de Forges, J. Koslow and G. Poore, "Diversity and endemism of benthic seamount fauna in the south-west Pacific", *Nature*, No. 405 (22 June 2000), pp. 944-947.

[10] J. Fossá, P. Mortensen and D. Furevik, "The deep-water coral *Lophelia pertusa* in Norwegian waters: distribution and fishery impacts", *Hydrobiologia*, vol. 471 (2002), pp. 1-12; J. Roberts, "The occurrence of the coral *Lophelia Pertusa* and other conspicuous epifauna around an oil platform in the North Sea", *Journal of the Society for Underwater Technology*, vol. 25 (2002), pp. 83-91; J. Gordon, "The Rockall Trough, north-east Atlantic: the cradle of deep-sea biological oceanography that is now being subjected to unsustainable fishing activity", *Journal of Northwest Atlantic Fishery Science*, vol. 31 (2003), pp. 57-83; M. Gianni, *High Seas Bottom Trawl Fisheries and their Impacts on the Biodiversity of Vulnerable Deep-Sea Ecosystems*. Report prepared for International Union for Conservation of Nature (IUCN), Natural Recources Defense Counsel, World Wildlife Fund International and Conservation International (2004).

mussels (*Bathymodiolous thermophilus*) and a variety of gastropods, polychaete worms and shrimps.[11]

20. The diversity of species around hydrothermal vents is low, but levels of endemism in these habitats are high (more than 90 per cent). Although different vents have similar taxa at higher taxonomic levels (the genus and family), at the species level there are significant differences between vents.[12] This led to the establishment of biogeographic provinces including the East Pacific, comprising the Galapagos Rift, the East Pacific Rise and the Guaymas Basin; the North-East Pacific; the Western Pacific, where hydrothermal vents have been found in a variety of back-arc basins, including the Lau Basin, the Manus Basin, the Marianas Trough and the Fiji Basin and the Okinawa Trough; and the mid-Atlantic, where a number of vents have been discovered, and on the South-West Indian Ridge, which is where the hottest and deepest vent sites ever discovered have been found, as well as new cold seeps near New Zealand.

3. Cold-water corals

21. Cold-water corals are formed by a few species of stony corals, including *Lophelia pertusa*, *Madrepora oculata*, *Solenosmilia variabilis*, *Goniocorella dumosa*, *Oculina varicosa*, *Enallopsammia profunda* and *Enallopsammia rostrata*. Discoveries of new cold-water coral reefs have continued over the past few years and have included the largest Lophelia reef found to date, the Røst Reef off the Lofoten Islands, which lies at a depth of 300 to 400 metres and covers an area 40 kilometres long by 2 to 3 kilometres wide. Sightings on the western side of the Atlantic Ocean are sparse, but indicate that a similar belt stretches from off the coast of Canada to Brazil.[13] Genetic analysis of *Lophelia pertusa* from off the Brazilian coast indicates a large genetic distance from European populations, which may suggest that the south-west Atlantic populations may not be co-specific to north-east Atlantic marine animals.[14]

22. In the southern hemisphere, cold-water coral ecosystems have been found associated with seamounts south of Tasmania, Australia, and around New Zealand. These coral ecosystems, as with *Lophelia pertusa* reefs, are associated with highly diverse and endemic communities of marine animals. The fracture zone in the South Pacific area has not been explored to confirm the existence of cold-water coral reef ecosystems. Likewise, the area off the coast of Chile has yet to be investigated for the presence of cold-water coral ecosystems.[14]

23. Other types of coral can form distinct habitats with associated communities of marine animals. In particular, large colonies of octo-corals or gorgonians can form dense forests or gardens, as found in the North Pacific, along the Aleutian Island chain, in the Bering Sea and in the Gulf of Alaska. These habitats are rich in rockfish (*Sebastes spp.*), shrimp and other crustaceans. They also host other suspension feeding attached animals, such as crinoids, basket stars and sponges.

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[11] http://www.marine-genomics-europe.org/.

[12] A. Rogers, "Molecular ecology and evolution of slope species", in *Ocean Margin Systems*, G. Wefer, D. Billet, D. Hebbeln, B. Jorgensen, M. Shuluter and T. Van Weering, editors (Heidelberg, Springer-Verlag, 2003).

[13] A. Klitgaard, "The fauna associated with outer shelf and upper slope sponges (*Porifera, Demospongia*) at the Faroe Islands, north-eastern Atlantic", *Sarsia*, vol. 80 (1995), pp. 1-22.

[14] http://www.icriforum.org/secretariat/palaugm/ITEM561_Hain.pdf.

Gorgonians and other corals form dense populations in areas such as canyons and may have a highly diverse associated fauna. The New England seamounts have recently been explored, primarily with regard to octocorals and fish. However, detailed results of these activities have not yet been reported.[15]

24. There is an urgent need to identify areas with cold-water coral or other biogenic reef communities. Deep-sea corals grow slowly and reefs take thousands of years to develop. The diversity and levels of endemism of species associated with such biogenic reefs are poorly understood and require urgent exploration. There is also little information on the reproduction, recruitment and ability of many reef-forming deep-sea corals, gorgonians and sponges to recover from human impacts. Most information is on *Lophelia pertusa*. In situ observations and experimentation are required to address these issues. Images of these structures can be obtained from ships using acoustic methods, but since vast areas of the seabed are potential habitats for reef-forming organisms, seabed assessment using autonomous underwater vehicles may be useful.

25. Although scientists generally agree that it is difficult at present to predict the impact of human activities on deep-sea species, there is some evidence of the impact of trawling on cold-water corals. It is recognized that gorgonian corals are extremely vulnerable to some types of fishing, notably bottom trawling, while other kinds of cold-water corals, such as some cup-corals, appear to have only average to low vulnerabilities.[16]

4. Other vulnerable marine ecosystems

26. Other VMEs include carbonate mounds and sponge fields. Carbonate mounds are very steep-sided mounds of a variety of shapes, which may be up to 350 metres high and 2 kilometres wide at their base, and may be found offshore in depths of 500 to 1,100 metres. Notably, these occur in areas such as the Porcupine Seabight and Rockall Trough.[17] The features are typically composed of carbonate sands, muds and silts. The cold-water reef-building corals (*Lophelia pertusa* and *Madrepora oculata*), as well as echiuran worms, are characteristic fauna of carbonate mounds.[18]

27. Sponge fields are a characteristic benthic component of many deep-sea assemblages all over the world. The majority of samples have been taken from depths between 800 and 6,000 metres. Some 65 species have been described to date.[19] Owing to their large size, slow growth rates and weak cementation, most sponge species are very fragile and thus only sampled using photographic methods. Despite their fragility, specimens may be quite abundant on abyssal seabeds. Mass occurrences of large sponges may be found around the Faroe Islands, East

[15] http://research.usm.maine.edu/gulfofmaine-census/about-the-gulf/physical-characteristics/geology/new-england-seamounts.

[16] *FAO Fisheries Report*, No. 829.

[17] N. Kenyon, A. Akhmetzhanov, A. Wheeler, T. van Weering, H. de Haas and M. Ivanov, "Giant carbonate mounds in the southern Rockall Trough", *Marine Geology*, vol. 195 (2003), pp. 5-30.

[18] Descriptions of Habitats on the Initial List of Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) Threatened and/or Declining Species and Habitats, Meeting of the OSPAR Biodiversity Committee, Bruges, Belgium, 16-20 February 2004.

[19] O. Tendal, "Synoptic checklist and bibliography of the Xenophyophorea (Protista), with a zoogeographical survey of the group", *Galathea Report*, vol. 17 (1996), pp. 79-101.

Greenland, around Iceland, in the Skagerrak off Norway and in the Barents Sea.[20] The presence of large sponges adds a low three-dimensional structure to the seabed, thus increasing habitat complexity and attracting a large number of other, smaller species from many phylae. These associated fauna have been investigated in the Faroe Islands, where it was found that sponges house about 250 species of invertebrates.[13]

28. It is believed that sponge fields may provide an important feeding habitat for various fish species including young ocean perch (*Sebastes spp.*) and groundfish. The fauna associated with sponge fields is reported to be at least twice as rich in species as the surrounding gravel or soft bottoms.[21]

B. Impacts of bottom fisheries on vulnerable marine ecosystems

29. Deep-sea habitats are particularly sensitive to anthropogenic disturbance due to the longevity, slow growth, low reproductive rates and endemism of the individuals that structure the habitat, their susceptibility to increased sedimentation, their fragility and limited ability to recover from physical fragmentation. A large number of studies have documented the effects of mobile fishing gear on benthic habitat, including the loss of habitat complexity, shifts in community structure and changes in ecosystem processes.[22] Changes in size structure, genetic composition, localized depletions and alteration of trophic structures in ecosystems have also been shown.[23] Previous reports of the Secretary-General have also described the impacts of bottom fishing activities on VMEs (A/59/62/Add.1, paras. 295-300, and A/61/154).

30. There is now sufficient information to predict the physical effects of the majority of existing fishing practices. Impacts result from a combination of the damage done by each gear deployment and the frequency of deployment. Any gear that has bottom contact has the potential to damage vulnerable deep-sea habitats. The degree of impact depends on the type of gear, the degree of contact with the seabed and the frequency of contact. Thus, even bottom gear with a low potential for damage per deployment can potentially cause significant impacts if used intensively.[24]

1. Fishing gears and practices used in deep-sea fisheries

31. The fishing methods used in the deep-sea range from hooks and lines, pots and enmeshing nets operated from small fishing vessels to trawl nets towed on and above the seabed by trawlers are described below.

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[20] A. Klitgaard and O. Tendal, "Distribution and species composition of mass occurrences of largesized sponges in the north-east Atlantic", *Progress in Oceanography*, vol. 61 (2004), pp. 57-98.

[21] A. Klitgaard, "The distribution and habitats in the North Atlantic of two gnathiid species (*Crustacea, Isopoda*) and their reproductive biology in the Denmark Strait and North of Iceland", *Meddelelser om Groland, Bioscience*, vol. 47 (1997).

[22] ICES, Report of the Working Group on Biology and Assessment of Deep-Sea Fisheries Resources, 2-11 May 2006.

[23] ICES *Journal of Marine Science*, vol. 63, No. 9, pp. 1567-1572.

[24] *ICES Advice 2009*, Book 9.

32. *Hook and line gear*. The principle element of long-line gear is the mainline or ground-line, which can extend up to 50 kilometres in length. Branching off the mainline at regular intervals are leaders or snoods, and hooks. Anchors hold each end of the mainline in place, and surface buoys attached via float lines to the anchors mark the location of the gear. All bottom-set, longline gear is considered fixed and passive because once deployed the gear does not move, and the fish voluntarily takes the hook. The bottom longline has a relatively small footprint on the seabed. Anchors hold the ends of the mainline to the seabed and the mainline lies across the seabed. The mainline can move around while the gear soaks and be dragged across the seabed in the process of hauling the gear. By-catch of coral trees and other epibenthos, including hard and soft corals, are known to occur. Vertical longline gear is usually set from smaller vessels sometimes fishing in association with fish aggregating devices. The gear consists of multiple hooks and leaders attached to a vertical line suspended from a buoy at the surface with a weight which is used to hold the hooks near the bottom. The fish aggregating devices are used to attract and concentrate the fish and baited hooks capture the fish. The seabed footprint of this gear is minimal as only the anchor touches the bottom, and, therefore, seabed impact is minimal.

33. *Pots*. Animals enter the pot gear seeking food, shelter, or both. A device allows the animal to enter the gear but restricts escape. The holding area retains the catch until the gear is retrieved. Bait is placed in a bag or cage within the pot to attract the target species. Culling rings or escape vents are added to the exterior wall of the pot to allow for the release of undersize sublegal or juvenile animals. Finfish and crustaceans are harvested with pots in deep water.

34. The use of pots in deep water has been shown to negatively impact some seabed habitat. While individual pots have a small footprint on the seabed, a large number of pots has a larger footprint than a longline, and can disturb the seabed by crushing animals or scraping epi-fauna attached to the seabed from its anchored location. Additionally, when several traps are attached together, the mainline will encounter and entangle hard and soft corals on the seabed. Pots that are lost on the seabed are known to ghost fish. Biodegradable panels or other technical means are used in some fisheries to prevent ghost fishing.[25]

35. *Enmeshing gear*. Enmeshing gear includes a group of fishing gear types which result in the capture of animals by a wall of webbing in the water column or on the bottom. The animals are captured by wedging or tangling. Shellfish and corals are easily entangled in bottom set enmeshing gear. Large fish become entangled in the gear by the jaw and large marine mammals become entangled by wrapping up in the webbing. Anchored sink gillnets are used to harvest demersal fish. Anchors are used at both ends of the net to hold the gear in a fixed location. Individual nets vary in length from 100 to 200 metres, and in depth from 2 to 10 metres. Multiple nets are attached together to form a string of nets, up to 2,000 metres in length. The impacts of gillnets and tangle nets on the seabed are a function of the type of seabed and the target fishery resource. On soft substrates the effects will be minimal, while on hard bottoms with attached, emergent fauna, the nets may tangle with corals and other organisms and remove them from the seabed.[16]

[25] http://www.sf.adfg.state.ak.us/FedAidPDFs/fds08-05.pdf.

36. *Trawlnets*. The bottom trawlnet is a funnel-shaped net, with a sweep which tends bottom as the net is towed. The largest trawlers, ranging from 50 to 100 metres in length, catch, process and freeze their products onboard, and are referred to as factory, catcher or processor trawlers. Smaller wetfish or freezer trawlers also operate in deep-sea fisheries. Bottom trawls have the potential to have a substantial impact on the seabed, depending on the weight of the gear, including doors and footropes. The size of the area impacted is a function of the width of the trawl and the distance it is towed. When used on sandy seabed, the impacts are minimal; the otter boards scar the seabed, and the trawl sweep only smooths the seabed removing small bedforms that are regenerated in a relatively short period of time. However, when used on hard, gravel, cobble or boulder seabeds, trawls roll over the larger rocks and scrape off attached, emergent epibenthic organisms, including sponges and corals. Numerous studies have documented the negative impacts of trawling on the hard seabed on continental shelves.[26]

37. Off-bottom or mid-water trawl nets are also used in deep-sea fisheries. The nets must be aimed or directed at specific concentrations of fish. Therefore, fishers must be able to identify the location of fish both laterally and vertically, and to direct the pelagic trawl to that position. Sonars are used to locate both fish and the fishing gear. When properly used, mid-water trawls have no impact on the seabed as the gear is not intended to contact the seabed. However, at times these gears do accidentally contact the seabed and, when this occurs, the impacts on the seabed habitat are similar to the impacts of a bottom trawl.

2. Impacts of bottom fishing gears on vulnerable marine ecosystems and associated biodiversity

38. Adverse impacts caused by fishing gears or other anthropogenic disturbances are impacts on populations, communities, or habitats that are more than minimal and not temporary in nature. If the consequences of an impact spread more widely in space or through ecosystem interactions and are not temporary, the impact is adverse even if the ecosystem feature directly impacted shows rapid recovery. Taking into account principle 15 of the 1992 Declaration of the United Nations Conference on Environment and Development (the Rio Declaration), adverse impacts become significant when the harm is serious or irreversible. Impacts that are likely to take several generations or decades to reverse, whichever is shorter, are considered irreversible. Intentional or accidental impacts that are likely to reduce the productivity of any population impacted by the fishery, or the productivity, species richness, or resilience of an impacted community or ecosystem, or the structural complexity of a habitat, are considered serious.[27]

39. Significant adverse impacts are those that compromise ecosystem integrity (i.e., ecosystem structure or function) in a manner that: (a) impairs the ability of affected populations to replace themselves; (b) degrades the long-term natural productivity of habitats; or (c) causes, on more than a temporary basis, significant

[26] *Hydrobiologia*, vol. 471 (2002), pp. 43-55; L. Watling and M. Risk, editors, *Biology of Cold Water Corals* (Kluwer Academic Publishers, 2002).

[27] Alex D. Rogers, Malcolm R. Clark, Jason M. Hall-Spencer, Kristina M. Gjerde (2008). *The Science behind the Guidelines: A Scientific Guide to the FAO Draft International Guidelines (December 2007) For the Management of Deep-Sea Fisheries in the High Seas and Examples of How the Guidelines May Be Practically Implemented. International Union for Conservation of Nature* (IUCN, Switzerland, 2008).

loss of species richness, habitat or community types. Impacts should be evaluated individually, in combination and cumulatively. When determining the scale and significance of an impact, the following six factors should be considered: (a) the intensity or severity of the impact at the specific site affected; (b) the spatial extent of the impact relative to the availability of the habitat type affected; (c) the sensitivity or vulnerability of the ecosystem to the impact; (d) the ability of an ecosystem to recover from harm, and the rate of such recovery; (e) the extent to which ecosystem functions may be altered by the impact; and (f) the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life history stages.[1]

40. Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable time frame. Such time frames should be decided on a case-by-case basis and should be in the order of 5 to 20 years, taking into account the specific features of the populations and ecosystems. In determining whether an impact is temporary, both the duration and the frequency at which an impact is repeated should be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact should be considered more than temporary. In circumstances of limited information, States and RFMO/As should apply the precautionary approach in their determinations regarding the nature and duration of impacts.[1,28]

41. *Immediate impacts*. The direct effects of bottom fisheries on VMEs and associated biodiversity are as follows: (a) mortality of target and non-target species as well as the killing of or injury to benthic species, making them vulnerable to scavengers or predators; (b) increased food availability of discarded fish, fish offal and dead benthic organisms for predators; and (c) loss of habitat as fishing gear causes destruction or disturbance of the sea floor.[29]

42. *Long-term impacts*. The indirect effects of fishing, including bottom fishing activities, may be characterized as follows: (a) fishing affects predator-prey relationships, which can lead to shifts in community structures that do not revert to the original condition upon the cessation of fishing pressure; (b) fishing can alter the population size and body size composition of species by affecting populations of large slow-growing and late-maturing species, leading to shifts in the relative abundance of species with different life history characteristics; (c) fishing can affect populations of non-target species (e.g. cetaceans, birds, reptiles and elasmobranch fish) as a result of by-catches; (d) fishing gear lost or voluntarily discarded at sea may apparently continue to catch fish for some time (ghost fishing), affecting both target and non-target stocks; (e) fishing can reduce habitat complexity and perturb seabed (benthic) communities; and (f) fishing can lead to genetic selection for different body and reproductive traits and can extirpate distinct local stocks.[30]

43. Additional concerns include the following: (a) the sensitivity and vulnerability of some species, communities and habitats to direct and indirect impacts of fishing (easily perturbed); (b) the extreme longevity (hundreds to thousands of years) of

[28] FAO Technical Guidelines for Responsible Fisheries, No. 4, Supp. 2 (Rome, 2003).

[29] http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/NEAFC%20request%20on%20identification%20of%20vulnerable%20marine%20ecosystems.pdf.

[30] National Research Council, *Effects of Trawling and Dredging on Seafloor Habitat*, Committee on Ecosystem Effects of Fishing Phase 1 — Effects of Bottom Trawling on Seafloor Habitats (Washington, D.C., National Academy Press, 2002).

individuals of some types of organisms (e.g., octocorals) or the long time over which some habitats develop, up to 8,000 years for cold-water coral reefs (slow recovery); (c) the low resilience of species, communities and habitats as a result of low productivity, great longevity, unpredictable and usually low recruitment, and low growth rates (unpredictable recovery); (d) high risk of loss of biodiversity, including extinctions, due to the endemism of a high proportion of species encountered within some deep-sea ecosystems; (e) the distribution of some vulnerable sea floor communities as spatially discrete units often within a small area relative to the overall area of the seabed (small perturbations may have significant consequences); and (f) the connectivity between populations within geographic regions that may be critical to the long-term sustainability of biodiversity (fragmentation and risk of loss of source populations).

III. Actions taken by States and regional fisheries management organizations and arrangements to adopt and implement measures to address the impacts of bottom fisheries on vulnerable marine ecosystems

44. In resolution 61/105, the General Assembly called upon States to take action immediately, individually and through RFMO/As, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect VMEs. RFMO/As with the competence to regulate bottom fisheries were called upon to adopt and implement measures, in accordance with the precautionary approach, ecosystem approaches and international law, as a matter of priority, but not later than 31 December 2008, to regulate bottom fishing activities and protect VMEs. States participating in negotiations for the establishment of an RFMO/A competent to regulate bottom fisheries were called upon to expedite those negotiations and to adopt and implement interim measures, by no later than 31 December 2007, consistent with paragraph 83 of the resolution. Flag States were similarly called upon to either adopt and implement measures in accordance with paragraph 83, or cease to authorize fishing vessels flying their flag to conduct bottom fisheries in areas beyond national jurisdiction where there was no RFMO/A with the competence to regulate such fisheries or interim measures in accordance with paragraph 85, until such measures were taken in accordance with paragraphs 83 or 85 of the resolution.

45. In response, a wide range of measures has been adopted and implemented by the international community to address the impacts of bottom fishing on VMEs, both in areas within and in areas beyond national jurisdiction. Such measures include: developing tools for identifying VMEs; assessing the impacts of bottom fishing on such ecosystems; prohibiting certain fishing practices in areas with VMEs; restricting gear types and use; collecting data and conducting research; relying on more comprehensive and rigorous use of scientific advice; establishing marine protected areas (MPAs); and closing areas to fishing.

46. In particular, many RFMO/As have adopted measures to ensure sustainable fisheries and prevent destructive fishing practices by implementing precautionary and ecosystem approaches, preventing habitat degradation, expanding research programmes and improving monitoring and enforcement. Regional fisheries organizations with the competence to regulate bottom fisheries have adopted a

framework for regulating the impacts of bottom fishing activities on VMEs. In addition, standards and criteria have been adopted, or are being developed, for identifying VMEs and the impacts of bottom fishing on those ecosystems. Some RFMO/As have recommended the temporary prohibition of bottom trawling and bottom gillnet fishing until impact assessments have been conducted.

47. In areas under national jurisdiction, several States have adopted and implemented conservation and management measures aimed at ensuring the long-term sustainability of fish stocks and protecting VMEs. Some States have prohibited trawling and dredging around VMEs and are in the process of undertaking extensive efforts to protect fishery habitat areas, in particular, through the establishment of MPAs. Other States have implemented conservation and management measures, on the basis of the precautionary approach and ecosystem approaches to fisheries management, to prevent significant adverse impacts of deep-sea fisheries on VMEs and associated marine biodiversity.

48. On the high seas, States participating in negotiations to establish new RFMO/As have adopted interim measures to address the impacts of bottom fishing activities on VMEs. Several States have taken action in respect of fishing vessels flying their flag to adopt laws and regulations implementing resolution 61/105 as well as measures ensuring compliance with the conservation and management measures of competent RFMO/As giving effect to the relevant provisions of the resolution.

A. Actions taken by regional fisheries management organizations and arrangements with competence to regulate bottom fisheries

49. In addition to the regional fisheries organizations with the competence to regulate bottom fisheries (i.e., Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), General Fisheries Commission for the Mediterranean (GFCM), Northwest Atlantic Fisheries Organization (NAFO), North East Atlantic Fisheries Commission (NEAFC), and South East Atlantic Fisheries Organization (SEAFO)), a number of other RFMO/As have taken measures to sustainably manage fish stocks and protect VMEs from destructive fishing practices.

50. The present section contains information on conservation and management measures adopted by RFMO/As to sustainably manage fish stocks and protect VMEs from destructive fishing practices, including measures to give effect to paragraph 83 of General Assembly resolution 61/105. The section is based on submissions received from: CCAMLR, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the Inter-American Tropical Tuna Commission (IATTC), the interim secretariat of Management of High Seas Bottom Fisheries in the North Western Pacific Ocean (NWPO), NEAFC, NAFO, the Pacific Island Forum Fisheries Agency (FFA), the North Atlantic Salmon Conservation Organization (NASCO), SEAFO, the interim secretariat of the South Pacific Regional Fisheries Management Organization (SPRFMO), and the Secretariat of the Pacific Community (SPC).

1. Overview of actions taken by RFMO/As

51. CCAMLR reported that it had adopted significant measures over the past two years to meet the 31 December 2008 deadline and implement the measures for the

management of bottom fisheries called for in paragraphs 81 and 83 of resolution 61/105. More specifically, CCAMLR agreed to limit the existing footprint of bottom fishing activity in its Regulatory Area and to implement mandatory reporting of VME indicator organisms by all fishing vessels. CCAMLR also agreed on a procedure to close areas to fishing when VME indicator organisms in an area exceeded a specific threshold level.[31]

52. Furthermore, CCAMLR members and the CCAMLR Scientific Committee were continuing their work on VMEs to reduce uncertainty about the potential impacts of fishing on these ecosystems and to identify and locate VMEs in the CCAMLR Convention Area. In this respect, CCAMLR had endorsed an approach that focused on developing a risk-assessment framework to assess the impacts of bottom longlines on VMEs owing to the lack of empirical evidence of the impacts of such fishing gear on VMEs and the difficulties in getting such information.

53. NAFO reported that resolution 61/105 was a watershed moment in the history of high seas fisheries, as it provided a clear outline for the identification and protection of VMEs. In particular, resolution 61/105 provided a way forward by identifying the essential elements of a framework that was sufficiently flexible to allow existing RFMO/As to integrate the new concepts in their operations, rather than prescribing the specifics of implementation. While the commitments generally reflected a collective desire to protect features such as corals and sponges, the resolution represented a regime shift for fisheries management.

54. In April 2008, NAFO held an extraordinary meeting during which it adopted comprehensive measures to comply with the deadline and fulfil the recommendations contained in resolution 61/105. According to these new provisions, in 2009 NAFO Contracting Parties were required to assess any proposed bottom fishing activity for anticipated impacts on VMEs. Regarding the deadline of 31 December 2008 contained in the resolution, NAFO indicated that the date was not necessarily synchronized with relevant international meetings, such as FAO Technical Consultations and scheduled activities of RFMO/As. It noted that while most States recognized the importance and relevance of having a collective date towards which to direct efforts, they also recognized, however, that complying with a deadline could not be the sole metric of success. NAFO had taken steps in an ongoing process that would continue during 2009, and beyond the 2009 review by the General Assembly.

55. NEAFC reported that the need to conserve vulnerable deep-sea habitats and species had been high on its agenda in recent years. It noted that the current science surrounding temperate area closures was uncertain, and it had thus moved forward in a precautionary and adaptive manner to close areas to bottom fisheries in order to protect VMEs, and to formalize procedures for area management. In 2006, NEAFC prohibited fisheries with gillnets, entangling nets and trammel nets in depths below 200 metres and introduced measures to remove and dispose of unmarked or illegal fixed gear and retrieve lost gear to minimize ghost fishing. It had previously agreed to reduce effort in all deep-water bottom fisheries by 35 per cent. The NEAFC scheme of control and enforcement had provided the tools to monitor and control areas where bottom fishing was prohibited, and it made mandatory the provision of

[31] CCAMLR Conservation Measure 22-05; Conservation Measure 22-0; and Conservation Measure 22-07.

real-time information on movements of fishing vessels to fisheries monitoring centres.

56. NEAFC had also closed a number of areas to bottom fisheries where VMEs were known or likely to occur. In 2002, NEAFC closed an area in the Rockall Area to protect juvenile fish, and in 2004 it adopted an interim ban on bottom fishing in a large area on the Reykjanes Ridge (the northern part of the Mid-Atlantic Ridge) and four seamounts adjacent to the Ridge.

57. In 2008, NEAFC adopted comprehensive measures, including specific operational procedures, on bottom fishing activities in its Regulatory Area.[32] Clear procedures and rules were now in place on identifying existing bottom fishing areas, conducting exploratory fishing in new bottom fishing areas, assessing bottom fishing activities, dealing with encounters with VMEs, and collecting data using new protocols for observers onboard fishing vessels to increase knowledge of vulnerable habitats in deep waters. NEAFC noted that its Contracting Parties recognized the importance of dialogue and collaboration with responsible fisheries operators and the value of industry information and experience in developing responsible fishing techniques and adapting gear, as well as implementing methods to avoid or mitigate significant adverse impacts on VMEs.

58. NEAFC considered that it had taken major initiatives in order to address its responsibilities for implementing resolution 61/105. As this was a dynamic process, NEAFC had committed itself to keeping under continuous review the measures currently in place, and to adjust those measures in the light of available scientific information and advice.

59. SEAFO reported that its management regime was designed to be science-based, to take into consideration an ecosystem approach and to apply the precautionary approach in the absence of reliable information. In 2008, SEAFO adopted interim comprehensive conservation and management measures relating to bottom fishing activities in all existing and new bottom fishing areas outside the SEAFO closed areas in order to protect VMEs from significant adverse impacts and to meet the deadline in resolution 61/105.[33] The measures dealt with the identification of existing bottom fishing areas, exploratory fishing in new bottom fishing areas, assessment of bottom fishing activities, and encounters with VMEs. SEAFO intended to review the measures in 2010 and to examine, on a biannual basis thereafter, the effectiveness of the provisions in protecting VMEs from significant adverse impacts.

60. SPC had facilitated discussions on the control of deep-sea bottom trawling within its membership and had provided technical advice to Pacific island countries and territories. There was currently no known deep-sea bottom trawling activity in the exclusive economic zones (EEZs) of any Pacific island country or territory. However, SPC had broadly supported the setting up of SPRFMO and it had provided technical advice to member countries participating in the establishment of SPRFMO. Furthermore, SPC had instigated a research project investigating seamount ecology in the region, focusing on the importance of seamounts in fisheries for highly migratory species and it had advised its members on the

[32] See Recommendation XVI (2008) and Recommendation XIII (2009).

[33] See Conservation Measures 06/06 on the Management of Vulnerable Deep Water Habitats and Ecosystems in the SEAFO Convention Area.

development and management of sustainable deep-sea fisheries using non-destructive fishing gear.

61. In 2005, GFCM banned bottom trawling at depths beyond 1,000 metres. Seabeds below 1,000 metres had not yet been explored by Mediterranean fleets. Thus, the ban was a precautionary measure to protect the still-intact and poorly understood deep-sea ecosystems. Over half the area of the Mediterranean has now been protected from the harmful impacts of bottom trawling.[34] In order to protect deep-sea sensitive habitats, GCFM also established three fisheries restricted areas in which fishing with towed dredges and bottom trawl nets was prohibited.[35]

62. GFCM also adopted measures in 2007 and 2009 to improve the gear selectivity of demersal trawl fisheries.[36] In 2009, GFCM adopted a recommendation on the establishment of a fisheries restricted area in the Gulf of Lions to protect spawning aggregations and deep-sea sensitive habitats.[37] Pursuant to the recommendation, the fishing effort for demersal stocks of vessels using towed nets, bottom and mid-water longlines, and bottom-set nets should not exceed the level of fishing effort applied in 2008 in the fisheries restricted area.

63. In 2008, FFA members that were party to the Nauru Agreement[38] concluded the Third Implementing Arrangement to the Nauru Agreement, which contained a range of measures applicable to licensed foreign fishing vessels within and beyond national jurisdiction, including a prohibition on fishing in two high seas enclaves, as a condition of fishing access to national waters. The measures were developed, in part, in response to the failure of the Western and Central Pacific Fisheries Commission (WCPFC) to adopt a measure for the conservation and management of vulnerable bigeye and yellowfin tuna stocks at its fourth session, in 2007. The initiative was affirmed at the fifth session of WCPFC, in December 2008, which supported the prohibition from 1 January 2010, unless otherwise decided. At its sixth session, in December 2009, WCPFC would also consider the closure of other high seas enclaves in the Pacific islands region. The measure would be binding on all WCPFC members and cooperating non-members and was expected to have a positive and indirect impact on the sustainable management of fish stocks and the protection of VMEs.

64. FFA observed that there was an urgent need to survey and identify VMEs that existed in the Pacific islands region, particularly within the high seas enclaves wholly surrounded by the EEZs of its members. It encouraged further assistance for marine scientific research that included the participation of adjacent coastal State representatives. FFA was of the view that any measures taken for the sustainable use of fish stocks and protection of VMEs should not result in the transfer of a disproportionate burden of conservation action onto developing States.

65. NASCO and CCSBT reported that they did not have the mandate to manage bottom fishing within their respective Convention Areas and that, consequently, they had not taken action in accordance with the provisions in resolution 61/105.

[34] See recommendation GFCM/2005/1 at www.gfcm.org/gfcm.

[35] Recommendation GFCM/2006/3.

[36] Resolution GFCM/31/2007/3, recommendation GFCM/31/2007/1, and recommendation GFCM/33/2009/2.

[37] Recommendation GFCM/33/2009/1.

[38] The Federated States of Micronesia, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, the Solomon Islands and Tuvalu.

NASCO managed fisheries for salmon in the North Atlantic, and the fisheries were, in most areas, prohibited beyond 12 nautical miles. The nature of the salmon fishing gear used was not considered to have adverse impacts on the environments in which it was deployed. IATTC likewise reported that paragraphs 83 to 90 of resolution 61/105 were not relevant to its work, as it had no responsibilities with respect to deep-sea fisheries in the high seas or bottom fisheries on VMEs.

2. Measures taken by competent RFMO/As to implement paragraphs 83 (a) to (d) of General Assembly resolution 61/105

(a) Assessment of significant adverse impacts of bottom fishing activities on VMEs

66. In paragraph 83 (a) of its resolution 61/105, the General Assembly called upon RFMO/As with the competence to regulate bottom fisheries to assess, on the basis of the best available scientific information, whether individual bottom fishing activities would have significant adverse impacts on VMEs, and to ensure that activities that would have significant adverse impacts on these ecosystems were managed to prevent such impacts, or not authorized to proceed. RFMO/As with the competence to regulate bottom fisheries have begun to take action to assess the impacts of fishing activities on marine habitats, including by identifying sensitive habitats within their respective convention areas, and to prevent significant adverse impacts of bottom fisheries by managing bottom fishing activities, or by not authorizing such activities to proceed.

67. CCAMLR adopted measures that required all individual bottom fishing activities commencing 1 December 2008 and thereafter to be assessed by its Scientific Committee. The assessments were to be based on the best available scientific information to determine if the activities, taking into account the history of bottom fishing in the areas, would contribute to having significant adverse impacts on VMEs, and to ensure that the activities were managed to prevent such impacts, or were not authorized to proceed.

68. CCAMLR Contracting Parties were required to submit information and a preliminary assessment with the best available data of the known and anticipated impacts of their bottom fishing activities on VMEs, including on benthos and benthic communities.[39] The information was to include the mitigation measures proposed by the Contracting Party to prevent such impacts. The CCAMLR Scientific Committee would assess the information before providing advice on whether the proposed bottom fishing activity would contribute to having significant adverse impacts on VMEs and, if so, whether the proposed or additional mitigation measures would prevent these impacts. CCAMLR would subsequently take into account the advice and recommendations provided by the Scientific Committee concerning bottom fishing activities before adopting conservation measures to prevent significant adverse impacts on VMEs.

69. In addition, CCAMLR Contracting Parties were required to adopt measures with respect to their vessels that participated in bottom fisheries in order to monitor and control such activities, including requiring each vessel to carry at least one CCAMLR-designated scientific observer to collect data. Vessels that failed to

[39] See CCAMLR Conservation Measure 22-06 (2008), Bottom fishing in the Convention Area, Annex 22-06/A.

submit required data with respect to conservation measures relevant to a bottom fishery were to be prohibited from continuing their participation in the fishery.

70. NAFO adopted a comprehensive programme to assess the impacts of bottom fishing activities on marine habitats and prevent significant adverse impacts on VMEs, including the closure of seamounts and the adoption of an interim exploratory fishery protocol for new fishing areas, and interim encounter provisions for VMEs in both fished and unfished areas of its Regulatory Area.[40] NAFO undertook a preliminary assessment of existing fisheries based on a comparison of the historic footprint and the map of possible VMEs and further assessment was expected to be undertaken when additional scientific information became available.

71. NAFO reported that its conservation and enforcement measures required its Scientific Council to identify VMEs and its Fisheries Commission to establish conservation and management measures to prevent significant adverse impacts to VMEs from individual fishing activities. In 2008, the Scientific Council identified three bottom gear types that could adversely affect sensitive bottom habitat (i.e., bottom trawls, gillnets and longlines). Bottom fishing activities in new and existing fishing areas needed to be proposed in advance and could only proceed after a scientific assessment had determined any known and anticipated impacts on VMEs. The Scientific Council would provide advice on whether a proposed bottom fishing activity would have significant adverse impacts on VMEs and, if so, whether mitigation measures would prevent such impacts. The Fisheries Commission would adopt conservation and management measures that were deemed adequate to prevent significant adverse impacts on VMEs, which may include the prohibition or restriction of certain bottom fishing activities or gear types and other measures.

72. In 2008, NEAFC adopted comprehensive measures on bottom fishing activities in the NEAFC Regulatory Area, including measures on how to assess bottom fishing activities.[41] The procedures for assessment required each Contracting Party to assess impacts for any proposed bottom fishing in 2009. The conclusion of a preliminary assessment was that current bottom fisheries practices in the Regulatory Area did not have significant adverse impacts on VMEs. Since scientific information was not always available, assessment of the risk of significant adverse impacts of bottom fishing activities would be an ongoing process, and NEAFC would continue its assessments in 2009 and beyond as information and experience grew.

73. In 2008, SEAFO adopted interim comprehensive conservation and management measures relating to bottom fishing activities in all existing and new bottom fishing areas outside SEAFO closed areas, including measures on assessing bottom fishing activities, in order to protect VMEs from significant adverse impacts in response to resolution 61/105.[33] The SEAFO Scientific Committee was tasked to identify VMEs in the Convention Area and map sites where they were known to occur or likely to occur, and provide such data and information to the SEAFO secretariat for circulation to all Contracting Parties. Proposed bottom fishing activities were subject to assessment by the Scientific Committee to determine if such activities, on the basis of the best available scientific information and taking

[40] http://www.nafo.int/publications/meetproc/2009/fc/fcwgsep08/annex4-6.html.

[41] See Recommendation XVI (2008).

into account the history of bottom fishing in the areas proposed, would have significant adverse impacts on VMEs.

(b) Identification of VMEs and determination of significant adverse impacts

74. In paragraph 83 (b) of General Assembly resolution 61/105, RFMO/As with the competence to regulate bottom fisheries were called upon to identify VMEs and determine whether bottom fishing activities would cause significant adverse impacts to such ecosystems and the long-term sustainability of deep-sea fish stocks, inter alia, by improving scientific research and data collection and sharing, and through new and exploratory fisheries.

75. Pursuant to that provision, RFMO/As with the competence to regulate bottom fisheries have adopted measures to identify VMEs and determine whether bottom fishing activities would cause significant adverse impacts on such ecosystems, including through scientific research and data collection and sharing, and new and exploratory fisheries. RFMO/As indicated that data collection and research programmes were in progress, in particular, with a view to identifying VMEs and to better understanding the impact of fishing on VMEs.

76. In that regard, CCAMLR, NAFO and NEAFC conducted extensive research programmes. Research by CCAMLR and NAFO was generally carried out by members through observer programmes and fishery surveys (i.e., acoustic and net surveys) and joint research programmes to collect data on target species; fisheries catch and effort data; and biological, ecological and environmental data. NEAFC has an agreement with the International Council for the Exploration of the Sea (ICES) for the provision of scientific advice, and with the Commission of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), which has a mandate to protect and conserve the marine environment in the North-East Atlantic.

77. CCAMLR was advised by its Scientific Committee, based on the best available scientific information, on where VMEs were known to occur or were likely to occur, and on potential mitigation measures. Contracting Parties were required to provide the Scientific Committee with all relevant information to assist in this work. The CCAMLR secretariat maintained an inventory including digital maps of all known VMEs in the Convention Area for circulation to all Contracting Parties and other relevant bodies. Information on the location and the type of any VME encountered in the course of scientific bottom fishing research activities was reported to the secretariat.[42]

78. In 2008, the NAFO Scientific Council produced a map of "candidate vulnerable ecosystems", as well as lists of vulnerable marine species in the NAFO Regulatory Area.[43] More detailed information on the location of vulnerable corals and sponges would be available later in 2009. In that regard, a joint research effort by several NAFO Contracting Parties and coordinated by the European Union and Spain, was under way to provide additional data on habitats and ecosystems of the international fishing grounds on the Grand Banks and Flemish Cap. Research efforts to survey benthic habitats would be undertaken in 2009 and 2010 that were expected

[42] See CCAMLR Conservation Measure 22-06 (2008), Bottom fishing in the Convention Area.

[43] See NAFO *Scientific Council Reports, 2008*, chap. 5, sect. 1 (e) (vi), Protection of vulnerable marine ecosystems, p. 35.

to delineate the location of corals and sponges in the Regulatory Area with much greater precision than had been possible to date. NAFO also planned to amend its conservation and enforcement measures to provide for the collection of biological data on seamounts in its Convention Area.

79. NAFO was in the process of finalizing its assessment of its "bottom fishing footprint". In the meantime, all areas below 2,000 metres had been defined as "new fishing areas" in which only exploratory fisheries would be permitted. In that regard, the NAFO conservation and enforcement measures,[44] contained provisions for exploratory fisheries applicable to "new fishing areas", which were defined as the areas outside the bottom fishing footprint. The regulations foresaw pre-authorization of such exploratory fisheries based on scientific assessment and provisions for the encounter of VMEs.

80. NEAFC reported that its Permanent Committee on Management and Science (PECMAS) had adopted procedures to consider proposals for area closures based on scientific advice from ICES. In 2006, NEAFC established procedures for reporting scientific information on deep-sea fisheries to ICES and had a standing request with ICES to provide more detailed advice on vulnerable habitats and deep-sea fisheries as more information became available.

81. In 2008, NEAFC adopted comprehensive measures on bottom fishing activities in its Regulatory Area, including procedures and rules for identifying existing bottom fishing areas and for conducting exploratory fishing in new bottom fishing areas.[32] It also adopted protocols for observers onboard fishing vessels to increase knowledge of vulnerable habitats in deep waters.

82. In 2008, SEAFO adopted interim conservation and management measures relating to bottom fishing activities outside SEAFO closed areas, including measures on identifying existing bottom fishing areas and conducting exploratory fisheries in new bottom fishing areas.[33] Exploratory fishing was not allowed in existing closed areas in SEAFO. In that regard, SEAFO had identified the location of seamounts in the SEAFO area by topographical study and had adopted conservation and management measures for VMEs as a precautionary measure, based on available scientific information. The conservation measures implemented would be reviewed in 2010 on advice from the Scientific Committee of SEAFO. All bottom fishing activities in new areas, or with bottom gear not previously used in the area, were otherwise considered to be exploratory fisheries and subject to an interim protocol, which included a harvest plan and a mitigation plan to prevent significant adverse impact on VMEs.

83. SEAFO also reported that it had recognized the need to enhance knowledge and understanding of the ecosystem and biodiversity within the Convention Area, in particular, along the Walvis Ridge and in SEAFO closed areas. In that regard, SEAFO supported the Mar-Eco project, which included the Mid-Atlantic Ridge and the adjacent waters from the Azores to Iceland. Research expeditions would survey much of the area using acoustic studies and mid-water trawling. Three sub-areas had been selected for more intensive sampling and observation by traditional and novel methods and technologies.[45]

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[44] See NAFO Conservation and Enforcement Measures, articles 3bis, 4bis, 5bis and annex XXV.

[45] The Mid-Atlantic Ridge Ecosystem (MAR-ECO) Project is one of 14 field programmes that are part of the Census of Marine Life, a 10-year global study of the abundance, distribution and diversity of marine life in the world's oceans. See www.mar-eco.no.

84. In this context, SEAFO had adopted an interim VME data collection programme and it would convene a special workshop in 2009 to clarify knowledge on bottom fishing and VMEs. The workshop would elucidate on bottom fishing and VMEs, taking into account the SEAFO conservation measure, and also provide a forum to facilitate the further development of the South Atlantic Mar-Eco research plans concerning the mapping of VMEs. SEAFO had approved the hiring of a consultant to develop a simple pictorial identification key for benthos including corals and sponges and to work with scientific institutes in the region to develop local expertise in this field.

(c) Measures applicable to areas with VMEs

85. In paragraph 83 (c) of General Assembly resolution 61/105, RFMO/As with the competence to regulate bottom fisheries were called upon to close areas to bottom fishing where VMEs were known to occur or were likely to occur, based on the best available scientific information, and ensure that such activities did not proceed unless conservation and management measures had been established to prevent significant adverse impacts on VMEs. Pursuant to resolution 61/105, RFMO/As with the competence to regulate bottom fisheries have adopted measures to close areas to bottom fishing to prevent significant adverse impacts, pending the adoption of conservation and management measures.

86. Specific measures were adopted by CCAMLR to limit the existing footprint of bottom fishing activity in its Regulatory Area. In 2008, CCAMLR restricted the use of bottom trawling gear in the high seas areas of its Convention Area to areas in which it had conservation measures in force for bottom trawling gear.[40] Regarding other areas of its Convention Area, CCAMLR had limited, until 30 November 2008, all bottom fishing activities to those areas for which bottom fishing activities had been approved by the Commission in the 2006-2007 fishing season. Thereafter, all individual bottom fishing activities were required to be assessed by the Scientific Committee.[42]

87. NAFO reported that since 2006, as a precautionary measure, it had closed to bottom fishing all the known seamounts in its Regulatory Area, as well as a large coral area on the south end of the Grand Banks.[43] In addition, NAFO had adopted provisions for temporary closures of locations in new fishing areas where evidence of VMEs had been encountered, until a scientific assessment had been conducted that allowed for the determination of adequate, more permanent, measures.[44]

88. In 2006, NEAFC amended its Convention and the London Declaration to create the formal basis for taking action to close areas to protect VMEs. As noted above, the NEAFC Permanent Committee on Management and Science had also adopted procedures to consider proposals for area closures, based on the scientific evaluation of proposals by ICES. In 2007, NEAFC closed five areas in the Rockall-Hatton Bank area to bottom fishing to protect deep-water corals, and, in April 2009, five areas on the Mid-Atlantic Ridge in the North-East Atlantic high seas to bottom fisheries in order to protect VMEs from significant adverse impacts, on the advice of ICES. Consequently, fishing activities by vessels flying the flags of NEAFC Contracting Parties or cooperating non-Contracting Parties, with fishing gear likely to contact the sea floor

[40] See CCAMLR Conservation Measure 22-05 (2008), Restrictions on the use of bottom trawling gear in high-seas areas of the Convention Area. The conservation measure does not apply to the use of bottom trawling gear in conducting scientific research in the CCAMLR Convention Area.

[43] See NAFO Conservation and Enforcement Measures, arts. 15 and 16.

during the normal course of fishing operations were prohibited within these areas.[48] Most of the remaining part of the NEAFC Regulatory Area was subject to the measures regulating bottom fishing adopted in 2008.

89. SEAFO reported that, in 2006, it had adopted conservation measures on the management of vulnerable deep water habitats and ecosystems and had closed 10 areas, including seamounts, to all types of fishing from 1 January 2007 to 31 December 2010, subject to the possible provision of small-scale and restricted exploratory fisheries.[49] The measures would be reviewed in 2010 and a decision would be taken on future management, which may include the extension of the application of the measures for an additional period or making the closure(s) permanent.

(d) Measures applicable for encounters with VMEs

90. In paragraph 83 (d) of General Assembly resolution 61/105, RFMO/As with the competence to regulate bottom fisheries were called upon to require vessels of members to cease bottom fishing activities in areas where, in the course of fishing operations, VMEs were encountered, and to report the encounter so that appropriate measures could be adopted in respect of the relevant site. Competent RFMO/As have thus taken measures that apply to vessels that encounter VMEs, including requiring vessels in these circumstances to cease bottom fishing activities and report the encounter.

91. CCAMLR adopted measures that required members to implement specific measures to monitor encounters with VMEs and notify CCAMLR of such encounters. In the absence of site-specific or other conservation measures to prevent significant adverse impacts on VMEs, vessels of Contracting Parties were required to cease bottom fishing activities in any location where evidence of a VME was encountered in the course of fishing operations. Such encounters were to be reported, in accordance with the CCAMLR catch and effort reporting system, so that appropriate measures could be adopted to prevent significant adverse impact on VMEs.[50] The CCAMLR Scientific Committee was also required to provide advice to CCAMLR on the known and anticipated impacts of bottom fishing activities on VMEs, and recommend practices, including ceasing fishing operations, if needed, when evidence of a VME was encountered in the course of bottom fishing operations.

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[48] The combined size of the closed areas, which include all five areas that were temporarily closed in 2004, is estimated at 333,000 square kilometres, covering a large portion of the Mid-Atlantic Ridge, an area larger than the United Kingdom and Ireland combined. The measure would be in force until 31 December 2015, but it will be reviewed before that time with a view to extending the period that the recommendation is in force, barring any conclusion that the continued application of the measure or parts of the measure was not required. If scientific research demonstrates that there are sub-areas where no vulnerable marine ecosystems are found within the areas referred to in the measure, the measure will be amended in order to exclude those sub-areas from the prohibition.

[49] See Conservation Measure 06/06 on the Management of Vulnerable Deep Water Habitats and Ecosystems in the SEAFO Convention Area at www.seafo.org. SEAFO has since decided that these areas would remain closed and fishing would not resume until certain processes had been respected (see Conservation Measure 11/07 laying down conditions for the resumption of fishing activities in areas subject to closure through conservation measure 06/06).

[50] See CCAMLR Conservation Measure 22-06 (2008), Bottom fishing in the Convention Area, Annex 22-06 B.

92. In addition, CCAMLR adopted an interim measure for the 2008-2009 fishing season for vessels involved in bottom longlining. The measure required these vessels to report and, in some instances, move on if there was sufficient evidence of the presence of VMEs. These vessels were also required to immediately report the encounter to CCAMLR, which would prohibit fishing in the area if the concentration of VMEs was sufficient to warrant it. The CCAMLR secretariat would keep records of locations where five or more VME indicators were present. If it received five such notifications within a certain area, it would notify all fishing vessels in the relevant fishery and their flag States that VMEs may be present. If it received notification that 10 or more VME indicators had been recovered in a one-line segment, as defined, all waters within a one-nautical-mile radius would be closed. The measure was to be reviewed by CCAMLR to determine if any modifications were necessary.[51]

93. In 2008, NAFO adopted interim encounter provisions for vessels operating potentially harmful gear types (i.e., trawl, gillnet and longline) and encountering VMEs beyond a defined threshold in the course of fishing operations.[52] Vessels were required to report an encounter with VMEs, cease fishing operations and move at least two nautical miles. For exploratory fisheries in new fishing areas, a temporary closure of a two-mile radius around the reporting position would also be implemented. The information reported from such encounters would then be scientifically assessed and reviewed by NAFO to determine and adopt any necessary measures for the protection of VMEs.

94. In 2008, NEAFC adopted comprehensive measures on bottom fishing activities in the NEAFC Regulatory Area, including specific operational procedures on dealing with encounters with VMEs. Under these measures, vessels of the NEAFC Contracting Parties were required to cease fishing activities in any site in the Regulatory Area where, in the course of fishing operations, evidence of VMEs was encountered, and report the encounter, including the location, and the type of the ecosystem in question, to the NEAFC secretariat so that appropriate measures could be adopted in respect of the relevant site. The operational procedures for encounters defined an encounter using threshold levels of indicator species of corals and other VME elements to identify, on a case-by-case basis, an actual encounter with VMEs. For new and existing bottom fisheries, the procedures required the cessation of fishing and the vessels to move on if the quantity of VME elements or indicator species caught in a fishing operation was beyond the defined threshold. In addition, procedures for temporary closures and conditions for the reopening of a temporary closure were provided in the case of new fishing areas.[32]

95. SEAFO adopted interim comprehensive conservation and management measures in 2008 relating to bottom fishing activities in all existing and new bottom fishing areas outside SEAFO closed areas, including specific operational procedures on encounters with VMEs.[33] As in the case of the NEAFC procedures, the operational procedure on encounters with VMEs required vessels to cease bottom fishing activities when the catch of VME indicator organisms reached a certain defined threshold. VME indicator species included antipatharians, gorgonians,

[51] See CCAMLR Conservation Measure 22-07 (2008), Interim measure for bottom fishing activities subject to Conservation Measure 22-06 encountering potential vulnerable marine ecosystems in the Convention Area.

[52] See NAFO Conservation and Enforcement Measures, chap. ibis, art. 5bis.

cerianthid anemone fields, *lophelia* and sea pen fields. In the case of existing bottom fishing areas, vessels were required to move away at least two nautical miles, while in the case of new fishing areas, an interim closure would apply in a two-nautical-mile radius around the reporting position of the VMEs.

B. Actions taken by States to regulate bottom fisheries

96. In resolution 61/105, the General Assembly called upon States to take action immediately, individually and through RFMO/As, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect VMEs from destructive fishing practices, recognizing the immense importance and value of deep sea ecosystems and the biodiversity they contain. In paragraphs 85 to 87 of the resolution, the Assembly also called upon States to take specific actions to regulate bottom fisheries and protect VMEs. The following section summarizes information provided by a number of respondents.[53]

1. Overview of actions taken by States

97. Several States emphasized the significance of the adoption of General Assembly resolution 61/105 (Canada, Republic of Korea, Russian Federation, United States) and the importance of the protection of VMEs. It was noted that the adoption of the resolution represented a regime shift for fisheries management, as it called for consideration of the possible significant adverse impacts of bottom fishing activities on VMEs, and for these impacts to be mitigated or fishing activities would not be allowed to proceed. The resolution was a watershed moment, as it provided for a road map for the assessment of individual bottom fishing activities, the identification and protection of VMEs, while allowing for responsible fisheries to continue. There was a general recognition that deep-sea habitats within and outside areas under national jurisdiction were extremely vulnerable and greater efforts were required to ensure their protection, particularly in high-seas areas where progress had been more limited (Canada, EC, New Zealand, United States).

98. A large number of States reported on progress being made at the national and regional levels in accordance with resolution 61/105 to ensure sustainable fisheries and prevent destructive fishing practices. Some States were in the process of amending their legislation to incorporate fisheries management measures that were aimed at reducing the impacts of fishing activities on VMEs, including the adoption of protected areas within areas under national jurisdiction. Several States submitted information on actions taken to implement the conservation and management measures adopted by RFMO/As, as well as measures implemented to conserve VMEs and ensure the long-term sustainability of deep-sea fish stocks. States also reported on measures taken in areas under their national jurisdiction in order to ensure, inter alia, consistency with measures to protect VMEs adopted by RFMO/As for high-seas areas under their competence.

[53] Information was provided by the EC and the following States: Australia, Benin, Brazil, Canada, Chad, Chile, Cook Islands, Croatia, Cuba, Iraq, Japan, Kuwait, Lithuania, New Zealand, Norway, Oman, Peru, Qatar, Republic of Korea, Russian Federation, Senegal, Seychelles, Slovakia, Suriname, United Kingdom, United States, Bolivarian Republic of Venezuela and Yemen.

99. States also welcomed the adoption of the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas, and expressed their readiness to actively engage in the FAO programmes for the implementation of the Guidelines and would endeavour to collect available scientific information and take other necessary actions for this purpose.

100. Those States participating in negotiations for the establishment of new international fishing agreements have adopted interim measures and established scientific procedures to protect VMEs and ensure the long-term sustainability of deep-sea fish stocks. In addition, States have adopted and implemented laws and regulations to control the fishing activities of vessels flying their flag on the high seas in order to conserve VMEs and ensure the long-term sustainability of deep-sea fish stocks where there was no competent RFMO/A. Data-collection and research efforts were also under way to identify, protect and manage VMEs.

2. Measures taken by States in areas within national jurisdiction

101. Several States reported on action taken with respect to areas within their national jurisdiction to sustainably manage fish stocks and protect VMEs from destructive fishing practices. Some States recalled that they had adopted such measures prior to the adoption of resolution 61/105 (Canada, France, New Zealand, United States). States have adopted a wide range of approaches and measures to sustainably manage fish stocks and protect VMEs from destructive fishing practices, including the use of area-based management tools, and conservation and management measures. Information was also provided regarding relevant research and data-collection activities. Some States (Benin, Chad, Croatia, Kuwait, Senegal, Yemen) reported on the development of their national legal and policy frameworks regarding sustainable fisheries and biodiversity.[54]

102. A number of States (Canada, Cuba, France, Norway, United States) elaborated on their respective frameworks for oceans management, regulation of fisheries and marine biodiversity with respect to the protection of VMEs from destructive fishing practices. Canada noted that, as a predominantly coastal fishing nation, it had developed a sustainable fisheries framework, which was the foundation for implementing an ecosystem approach in the management of fisheries. In support of this framework, a policy to manage the impacts of fishing on sensitive benthic areas was developed. The policy applied to all commercial, recreational and aboriginal marine fishing activities that were licensed and/or managed, both within and outside Canada's EEZ. The policy outlined separate processes for historically fished and frontier areas. It required greater precaution when fishing activities were being considered in frontier areas. Special consideration was given to historically fished areas that have not been exposed to bottom-contact fishing, in particular, proposals for new bottom-contact fishing in these areas required risk assessments prior to proceeding.

[54] Benin reported on the adoption of the Fisheries Code in 2007, which was yet to be promulgated, and the adoption of its fisheries development policy, which was endorsed in March 2007 by various fisheries stakeholders. Chad reported on the recent adoption of national fisheries legislation. Kuwait stated that it was implementing fisheries regulations with the purpose of conserving marine biodiversity. Senegal reported that the new marine fisheries act would include the precautionary approach and the ecosystem approaches.

103. Canada's integrated management process for the oceans, adopted under its Oceans Act 1996, provided for the management of ocean-based activities to ensure the sustainable use of marine resources and their habitats, including VMEs. The first integrated management plan, released in 2007, provided direction and commitment for ecosystem-based and adaptive management of marine activities.

104. Cuba reported that its fishing resources policy was based on a preventative approach and mainly focused on preservation of marine ecosystems, in particular areas vulnerable to damage from fishing activities.

105. France's mainland territory and overseas departments were under the jurisdiction of the EC Common Fisheries Policy. Deep-sea fishing activities conducted by vessels registered in mainland France and its overseas departments were therefore regulated by the EC regulation governing the protection of high-seas VMEs against adverse impacts of bottom fishing gear. It pointed out that bottom fishing activities were not conducted in French territories outside the jurisdiction of the Common Fisheries Policy and therefore no specific measures to implement the relevant provisions of resolution 61/105 had been taken in these territories. France noted that it had taken steps to protect VMEs even before the adoption of General Assembly resolution 61/105. Particularly noteworthy were measures it had adopted to regulate alfonsino fisheries and prohibit the use of dragged gear (trawls and dredges) in areas where there were deep-sea habitats, as well as specific regulation applicable to various fisheries in its Southern and Antarctic territories, where the trawl fleet targeting toothfish had been entirely replaced by a longline fleet. Other measures prohibited all forms of discards that might result in pollution of the seabed, and required an impact assessment for any experimental use of new fishing techniques, such as that currently under way for the use of pots in the toothfish fisheries around Crozet Island.

106. Norway was working, in accordance with the precautionary approach, towards the adoption and implementation of national regulations on bottom fishing, similar to those of NAFO and NEAFC, in its EEZ, the fishery zone around Jan Mayen and the fishery protection zone around Svalbard. The regulations would be adapted to national fisheries and aimed at the protection of VMEs from destructive fishing practices. Norway noted that its flagged vessels had a general duty of care when operating near known coral reefs to protect the reefs against damage as a result of fishing activities and to contribute to sound resource management. Furthermore, causing deliberate damage to coral reefs was prohibited.

107. Area-based management tools have been employed by States to protect VMEs from destructive fishing practices and to sustainably manage fish stocks (Canada, New Zealand, Peru, United States). A number of States have established MPAs, marine reserves, benthic protected areas (BPAs) and other areas in which measures such as spatial closures, temporal closures, restrictions or prohibitions on fishing activities, and gear modifications applied (see also A/62/260, paras. 67-69 and A/63/128, paras. 66-69).

108. Canada highlighted two MPAs (Bowie Seamount MPA and Musquash estuary) in which VMEs were found. The most common management measures used by Canada to protect sensitive marine areas and sensitive species in its coastal areas in the Arctic (including areas falling with the NAFO Regulatory Area), Atlantic and Pacific oceans, were temporal and area closures and gear restrictions. The measures included the closures of areas (including areas with sponge reefs, coral reefs,

seamounts and spawning grounds), for all or part of the year, to all fishing, restriction of certain fishing activities (including mid-water and bottom trawling, and fishing for certain target species) and restriction of the use of specified gear (including gear designed to come into contact with the sea floor and demersal fishing gear). Gear restrictions included also minimum and maximum mesh sizes for nets and traps, minimum size of longline hooks, restrictions on the use of nets, design requirements, and measures to minimize lost gear in order to reduce habitat destruction and by-catch.

109. Cuba adopted management measures upon the completion of research projects that focused on species vulnerable to continued exploitation. The measures included the establishment in 2007 and 2008 of a special use and protection regime in six areas. Other measures included a permanent closed season to protect endangered species, including turtle species; a temporary closed season for lobster, redtailed snapper, shrimp and conch; minimum and maximum size limits for lobster exploitation; catch quotas for conch and sea cucumber; and limits on shrimp fishing efforts. Destructive fishing practices, in particular the use of trawl nets causing damage to seabeds, would be phased out.

110. New Zealand has undertaken two major initiatives within its EEZ to protect VMEs and other benthic habitats. In 2000, New Zealand prohibited all trawling and dredging in 18 areas around seamounts to protect the sea floor environment, which amounted to an area of approximately 81,000 square kilometres. These closures protected 25 underwater topographic features, 12 of which were large seamounts that rose more than 1,000 metres from the sea floor. In 2007, regulations were made under the Fisheries Act 1996 establishing BPAs over 1,134,000 square kilometres of New Zealand's waters. In the BPAs, dredging was prohibited and the use of nets restricted to avoid impacts on the sea floor. Together, the seamount closures and BPAs protected 28 per cent of known underwater topographic features, 52 per cent of known seamounts and 88 per cent of known active hydrothermal vents.

111. Peru adopted a regulation governing the management of hake fishing, which prohibited trawlers from fishing within specified distances from the coast and in designated vulnerable areas. It also established closed seasons during spawning, and imposed gear restrictions and size limits. Senegal and Qatar reported that they were establishing MPAs.

112. The United States had taken a variety of domestic actions, through its regional fisheries management councils or protected area programmes, to protect VMEs. Examples included designating essential fish habitats, habitat areas of concern, MPAs, national marine sanctuaries and marine national monuments, and developing regulations to reduce the impacts of fishing activities on vulnerable benthic habitats and ecosystems. Specific measures included prohibiting bottom trawling, limiting the expansion of bottom trawling, prohibiting the use of specific gear (including fixed and/or mobile bottom-contact fishing gear) and fishing techniques in certain areas or sites, and seasonal closures. The United States noted that its efforts to protect VMEs within its EEZ were ongoing.

113. The United States indicated that its recent measures included the adoption of precautionary measures "freezing the footprint" of bottom trawling in an area in the North Bering Sea, which came into effect in July 2008; a call for public proposals to nominate new habitat areas of particular concern in the New England region; the establishment of eight deepwater MPAs in the south Atlantic; and the approval in

January 2009 of an additional area in the Gulf of Mexico to be managed with gear restrictions and seasonal closures. In January 2009, three new marine national monuments were declared (Rose Atoll, Pacific Remote Islands, and Marianas Trench) and management regimes for all three monuments were being developed. The South Atlantic Fishery Management Council planned to vote in June 2009 on banning bottom trawls, bottom longlines and other destructive fishing gear across 23,000 square miles, an area thought to encompass the largest deepwater reef system in the world.

114. Several States also reported on management measures adopted in areas within national jurisdiction to conserve and manage fish stocks, and protect VMEs (see also A/62/260, para. 69, and A/63/128, paras. 66 and 68). The measures included the prohibition of bottom-trawling entirely within their EEZs at certain depths or within certain distances from their coastlines (Croatia, Qatar, Bolivarian Republic of Venezuela).

115. Croatia stated that it would incorporate within its domestic law the prohibition of trawling below 1,000 metres, as adopted by GFCM. The Bolivarian Republic of Venezuela reported that artisanal bottom fishing would be progressively replaced by other methods that would guarantee the sustainable development of fisheries resources and the marine environment. In addition, States have prohibited the use of destructive fishing gear in all or specific areas (Benin, Qatar), prohibited pair-trawling (Benin), prohibited fishing in nursery habitats (Kuwait), closed areas to fishing for certain stocks during breeding seasons (Kuwait), imposed gear restrictions (Kuwait, Yemen), and required trawl vessels to use turtle excluder devices (Suriname). Seychelles reported that it did not issue licences for deep-sea fishing in its EEZ.

116. New Zealand reported that it managed its major deep-sea stocks under the quota management system. For the period 2007-2008, there was sufficient information to characterize stock status for 101 of the 628 stocks in the quota management system. This accounted for 66 per cent of total landings by weight and value and represented the main commercial species. Of the 101 stocks or sub-stocks with known status, 72 were near or above target levels. For those below optimum levels, rebuilding plans or other management controls were in place.

117. Peru has adopted regulations governing the conservation and management of the Patagonian toothfish, which provided for the application of selective fishing methods using only longlines with multiple hooks and bottom longlines, and the regulation of fishing effort. These measures were in accordance with the measures adopted by CCAMLR.

118. Some States emphasized the importance of scientific advice in fisheries management (Canada, New Zealand) and provided details of their research and data-collection activities to identify, protect and manage VMEs (Canada, Croatia, Norway, Peru, United States) (see also A/63/128, paras. 70 and 71). Canada supported scientific research and international collaboration, which focused on detecting, identifying and mapping VMEs, and assessing significant adverse impacts and recoverability. Croatia reported that it had developed monitoring and research programmes to determine the status of small pelagic fish and demersal resources, and assess the impact of demersal gears on non-commercial stocks. Croatia has participated in international programmes and surveys, such as the International Bottom Trawl Survey in the Mediterranean. A national project to map VMEs in the

Mediterranean Sea region, in particular seagrass (*posidonia*) beds was under way. The Cook Islands was in the process of developing a certified data-collection officer programme.

119. The European Community reported that through the Hotspot Ecosystems Research on the Margins of European Seas (HERMES) project, it was seeking to better understand the boundaries, structure and dynamics of marine ecosystems; the response of those ecosystems to human activities, with special emphasis on fishing; and forecasting the effects of fishing in the light of the biological interactions of small groups of fish stocks. The integrated study of oceanic seamounts sought to better assess naturally occurring mechanisms of ecosystem functioning. The HERMES project has also studied "hotspot" ecosystems, which were discontinuous environments that were constrained by chemical, physical, topographic and geological factors and which contained a wealth of unknown species that thrived in insular habitats. Determining the distribution and resilience of these ecosystems was fundamental to producing plans for their sustainable management.[55]

120. Norway and Peru referred to the need for research and scientific information for the adoption and implementation of measures concerning VMEs. The United States reported that a research plan for the Northern Bering Sea Research Area was under development.

121. Some States also provided information regarding monitoring, control and surveillance measures in areas under their national jurisdiction (Croatia, Suriname, United States). Croatia monitored vessels flying its flag through Vessel Monitoring Systems (VMS). Suriname's domestic trawl vessels were required to carry VMS. The United States reported that from 2003, VMS was required for rock shrimp fishing vessels in the South Atlantic region to enhance surveillance and enforcement of the Oculina habitat area of particular concern.

3. Implementation by States of measures adopted by competent RFMO/As

122. States have attached great importance to the protection of marine ecosystems and they have made active efforts to implement the measures recommended by the General Assembly to RFMO/As, as contained in paragraph 83 of resolution 61/105, in application of the precautionary approach to protect VMEs. States recognized the role of RFMO/As as primary mechanisms for managing deep-water fisheries and their impacts on VMEs in areas beyond national jurisdiction (Canada, EC, France, Japan, United States). They have, therefore, adopted laws and regulations to ensure compliance by vessels flying their flags with conservation and management measures adopted by RFMO/As in areas falling under their competence.

123. In particular, these laws and regulations addressed the requirement for all high-seas bottom fishing vessels to: (a) assess potential adverse impacts of bottom fishing activities on VMEs; (b) identify VMEs and determine whether bottom fishing activities would have significant adverse impacts to such ecosystems; (c) close areas where VMEs were known or likely to occur, until conservation and management measures have been established to prevent significant adverse impacts on such ecosystems; and (d) cease bottom fishing activities in areas where VMEs were encountered. In addition, States have endeavoured to improve scientific research and data collection and sharing, and conduct exploratory fisheries, in order

[55] http://www.eu-hermes.net/.

to identify VMEs and determine whether bottom fishing activities would have significant adverse impacts on such ecosystems and the long-term sustainability of deep-sea fish stocks.

124. In the CCAMLR Convention Area, several States (Australia, Canada, Chile, New Zealand, Norway, Republic of Korea, Russian Federation, United States) in accordance with resolution 61/105, have taken measures to implement the conservation and management measures adopted by the Organization.

125. Australia indicated that it had provided assistance to CCAMLR in the protection of VMEs and the management of bottom fishing activities in the CCAMLR Convention Area. Since the adoption of resolution 61/105, it had implemented the CCAMLR conservation measures giving effect to the resolution and worked on the identification of VMEs as well as the improvement of data collection. Following a proposal by Australia in 2008, CCAMLR placed the first two areas with VMEs on the CCAMLR VME register.

126. New Zealand implemented the CCAMLR conservation and management measures through the imposition of conditions on permits issued to fishing vessels flying its flag intending to fish in the Convention Area. These conditions required these vessels to use only the bottom longline method of fishing, fish only in areas for which CCAMLR has approved such fishing; collect VME indicator data and report data in accordance with regulation requirements; abide by any fishing area closure; and refrain from fishing at depths shallower than 550 metres in the exploratory toothfish fisheries. Vessels carried both a CCAMLR scientific observer and a national observer. New Zealand has also submitted to CCAMLR a comprehensive preliminary assessment of the impacts of its proposed bottom fishing activities for 2008-2009. Further reports on risk-assessment methodology for assessing the potential impacts of bottom longlines on VMEs and a field guide for observers to help in the identification of VME indicator species were submitted in 2008. In addition, New Zealand vessels fishing in some specific areas were required to collect all potential VME indicators caught through fishing and return them to port. Results of sample analyses were presented to the workshop held in the United States in August 2009 and also used for New Zealand's preliminary assessment for 2009-2010.

127. The Russian Federation observed that it had played an active role in the development of CCAMLR Conservation Measure 22-06 (2008) to regulate bottom fisheries in the Convention Area. Chile applied the conservation measures adopted by CCAMLR in 2008 to regulate bottom fisheries and protect VMEs. One such measure restricted the use of bottom trawling gear in high-seas areas of the Convention Area to areas where conservation measures were in force for such gear. Other conservation measures provided procedures for the assessment of bottom fishing, encounters with VMEs, monitoring and control of bottom fishing activities, data collection and sharing, as well as measures to establish a procedure for confirming the existence of VMEs and measures aimed at preventing fishing activities from impacting such ecosystems, including temporary cessation of fishing activities.

128. The United States stated that, on the basis of its proposal, CCAMLR adopted in 2007 conservation and management measures consistent with resolution 61/105. Such measures went beyond the provision of the resolution in several respects, including a requirement that all vessels engaged in bottom fishing had to carry an

observer onboard. In support of CCAMLR measures in 2009 it hosted a workshop on CCAMLR-area VME indicators to facilitate data-sharing and assist CCAMLR in further refining its bottom fishing measures. The Republic of Korea had implemented CCAMLR Conservation Measure 22-06 (2008), which subjected all individual bottom fishing activities commencing on 1 December 2008 to assessment by the CCAMLR Scientific Committee to determine whether such activities would have adverse impacts on VMEs.

129. Brazil noted that it was a party to CCAMLR, but did not practice any fishing in the area regulated by the Organization. However, it acknowledged that CCAMLR had received "preliminary" impact assessments from some flag States bottom fishing in the region and that those "preliminary" impact assessments did not fully comply with the criteria for impact assessments established in the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas.

130. In the north-west Atlantic region, several respondents (Canada, EC, Lithuania, Russian Federation, Spain, United States) had taken measures to implement measures adopted by NAFO in its Regulatory Area. Canada reported that it was actively participating in NAFO activities as a contracting party and as a coastal State with stocks straddling the NAFO Regulatory Area. Canada noted that it played an important role in the regime shift of NAFO towards the effective protection of VMEs, leading to the creation of new bodies to respond to the need to identify VMEs and assess and mitigate the effects of fishing activities, the adoption of new management measures, and a commitment to additional science to support decision-making. In order to support research efforts in NAFO, Canada planned to undertake research surveys to enhance knowledge of benthic habitat, including delineation of the location of corals and sponges in the NAFO Regulatory Area. Moreover, it established a Centre for Expertise on Cold-Water Corals and Sponge Reefs in St. John's, Newfoundland and Labrador, dedicated to compiling current information and available resources on corals and sponges on a national basis.

131. The European Community reported that it supported the closures of VME areas identified by the NAFO Joint Working Group Meeting of Fisheries Managers and Scientists on VMEs, held in March 2009. In connection with the presentation by the Joint Working Group to the 2009 Annual Meeting regarding options for the introduction of interim closures of identified VMEs in relation to corals, the EC strongly suggested that a risk analysis be undertaken on the option retained. In addition, EC proposed to lower substantially the encounter thresholds triggering the identification of VMEs during fishing operations and stressed the need to develop a "footprint" of existing fisheries, as well as to declare any fisheries conducted outside the "footprint" area as new fisheries to be subject to the specific NAFO protocol for such fisheries.

132. In June 2009, Spain conducted an international mapping project of VMEs at depth of less than 2000 metres. In addition to Spanish scientific bodies, other scientists from Canada, the United States and the United Kingdom participated in the project. Lithuania indicated that, as a contracting party to NAFO, it had enforced a ban on fishing in a defined area of significant coral concentration that spanned between the high seas and the Canadian EEZ, as well as a 2009 Conservation and Enforcement Measure on bottom fisheries in NAFO. The United States reported that its National Oceanic and Atmospheric Administration had supported research in the NAFO region on the New England seamount chain and the Corner Rise seamount

cluster. In each of these seamount areas, it identified vulnerable deep coral ecosystems that had the potential to be seriously damaged by bottom-tending fishing gear, especially bottom trawl gear. France supported the 2008 amendments to NAFO conservation measures requiring the adoption of exploratory fishing protocol for new fishing areas where the gear used may come in contact with the seabed.

133. In the north-east Atlantic region, several respondents (Lithuania, EC, Norway, Russian Federation) provided information on action they had taken to comply with the conservation and management measures adopted by NEAFC in its Regulatory Area. Norway implemented the conservation and management measures established by NEAFC and NAFO to protect VMEs, through its regulations of 9 February 2009 on bottom fishing activities in areas beyond national jurisdiction in the north-east Atlantic Ocean and the north-west Atlantic Ocean. In 2009, EC proposed that NEAFC close the areas identified by OSPAR and extend the area closure to Hatton Bank, based on the Spanish surveys of the seabed and an ICES recommendation to that effect. No agreement was reached on these proposals. EC made also a proposal to reduce immediately by 50 per cent the current thresholds of 100 kilograms of live corals and 1,000 kilograms of live sponges, which triggered the identification of possible VMEs during fishing operations. NEAFC agreed to recommend new reduced levels of thresholds at its 2009 Annual Meeting.

134. In respect of its fishing vessels, Lithuania enforced the regulations adopted by NEAFC to implement paragraph 83 of resolution 61/105, including the prohibition in 2007 of bottom fishing in some areas of the Regulatory Area to protect deep-water corals; the reduction of effort in all deep-water bottom fisheries by 35 per cent; the prohibition of gillnets, entangling nets and trammel nets below 200 metres; and the removal of unmarked or illegal fixed gear and retrieval of lost gear to minimize ghost fishing. It also implemented NEAFC Recommendation XVI (2008) on the identification of existing bottom fishing areas, bottom fishing activities in new bottom fishing areas, assessment of bottom fishing activities and encounters with VMEs, as well as NEAFC Recommendation XIV (2009) for the protection of vulnerable deep-water habitats and NEAFC Recommendation XIII (2009) on operational procedures for fishing in existing and new bottom fishing areas.

135. The Russian Federation indicated that it had participated actively in the development of measures to regulate deep-sea fisheries and protection of VMEs, within relevant RFMO/As, in accordance with General Assembly resolution 61/105. It had been involved in several NAFO and NEAFC activities concerning the management of bottom fisheries, such as the scientific justification of the closure of fisheries to bottom fishing in some areas of NAFO and the regulation of bottom fisheries in the respective Regulatory Areas of NEAFC and NAFO. It had also monitored compliance by its vessels with the measures adopted by NEAFC and NAFO to regulate bottom fisheries, including through the adoption of regulations by the Russian Federal Agency for Fisheries; the preliminary approval and analysis of applications for bottom fishing activities from Russian vessel owners; the issuing of authorizations to vessel owners, taking into account the regulations of NEAFC and NAFO for bottom fisheries; and monitoring the activities of fishing vessels through satellite VMS and inspections, to prevent violations in areas with VMEs.

136. In the south-east Atlantic region, a number of States (Japan, Republic of Korea) and the EC reported on the actions they had taken to implement the measures

adopted by SEAFO, in accordance with resolution 61/105. EC stated that, on the basis of its proposals, SEAFO adopted Conservation Measure 06/6 (2006), which closed several areas that were deemed to be vulnerable deep water habitats and ecosystems, as well as Conservation Measure 11/07 (2007), which laid down the conditions for the opening of fisheries in previously closed areas. The conditions required that mapping of the concerned area be undertaken, along with an impact assessment and a research fishery plan, before fishing was allowed to resume.

137. Japan required vessels flying its flag operating in the SEAFO Convention Area to comply with SEAFO conservation measures, despite the fact that it had observer status with SEAFO. These measures included submission of catch data, entry/exit reports to SEAFO fishing areas, mandatory onboard scientific observers, submission of observer reports, and equipping vessels with VMS. Compliance with these regulations ensured the transparency of its fishing operations in the SEAFO Convention Area. Japan, however, did not adopt any of the mitigation measures adopted by SEAFO to prevent serious adverse impacts on VMEs, as its fishing fleet operated longline fisheries and crab pots fisheries in the Convention Area, which caused less adverse impacts on VMEs than trawl fisheries. The Republic of Korea also indicated that it had observer status with SEAFO, but it had complied with SEAFO Conservation Measure 12/08 on Bottom Fishing Activities, which was adopted as an interim measure at the SEAFO fifth Annual Meeting to implement resolution 61/105.

138. In the GFCM Convention Area, Croatia, as a member of GFCM, implemented the prohibition of trawling below 1,000 metres established by the Organization in the area under its competence. It also applied a strict licensing regime for its fishing vessels operating in the Convention Area.

4. Establishment of new RFMO/As with competence to regulate bottom fisheries and adoption and implementation of interim measures

139. Paragraph 85 of General Assembly resolution 61/105 called upon States participating in negotiations to establish a regional fisheries management organization or arrangement competent to regulate bottom fisheries to expedite such negotiations and, by no later than 31 December 2007, to adopt and implement interim measures consistent with paragraph 83 of the resolution and make these measures publicly available. States have thus recognized the importance of protecting VMEs as habitats for marine biodiversity in areas where no competent RFMO/A exists, given the vulnerability of deep-sea species to exploitation and their low potential for recovery. Several States have made efforts to establish new RFMO/As in the north-west and south Pacific, including through the adoption of interim measures to sustainably manage fish stocks and protect VMEs, pending the entry into force of the agreement or arrangement to establish the new RFMO/A and the adoption of conservation and management regimes.

140. In respect of the South Indian Ocean, the South Indian Ocean Fisheries Agreement (SIOFA) was adopted at a conference convened by FAO in Rome in July 2006. The Agreement has the mandate to conserve and manage non-tuna resources in areas beyond national jurisdiction of coastal States in the southern Indian Ocean. Six States (Comoros, France, Kenya, Mozambique, New Zealand and Seychelles) and EC have signed the Agreement. However, it has not yet entered into force. At the conference, two resolutions were adopted by the participants, one addressing

data collection and the handling of information and data pertaining to high-seas fisheries, and the other addressing interim arrangements for the conservation and management of the high-seas fishery resources in the Southern Indian Ocean, in which interested States and regional economic integration organizations were called upon to cooperate towards the conservation and management of the fishery resources covered by the Agreement, pending its entry into force. The interim arrangements include data collection relating to fisheries and fishery resources, the facilitation of scientific assessments of stocks, development of standards for vessel authorization, and arrangements for secretariat services (see A/61/154, para. 190).

141. At the conclusion of the conference, members of the Southern Indian Ocean Deepwater Fisheries Association (SIODFA), who had been fishing in the Agreement Area since 1996, announced the voluntary closure to fishing by their vessels of 11 high seas areas representing 309,000 square kilometres. It was stated that these BPAs would result in the conservation of deepwater corals and other related bottom fauna.[56] The Cook Islands reported that it supported the initiatives of SIODFA.

(a) North-west Pacific

142. *Status of negotiations*. A number of States (Canada, Japan, Republic of Korea, United States) have been participating in consultations to establish a new mechanism for management of high seas bottom trawling in the north-west Pacific Ocean.[57] Six intergovernmental meetings have been held to date and the discussions have led to the adoption of voluntary interim measures to give effect to the relevant provisions of General Assembly resolution 61/105. The interim measures were adopted at the second intergovernmental meeting held in Busan, Republic of Korea, in 2007, and further strengthened at meetings held in 2007 and 2008. At the sixth intergovernmental meeting held in Busan in 2009, the interim measures were further amended to reflect additional elements and to clarify implementation in a number of key areas.[58]

143. In parallel with ongoing work to meet the requirements of resolution 61/105 concerning interim measures, participating States have continued to negotiate an instrument to establish the new regional fishery management mechanism. In accordance with paragraph 85 of resolution 61/105, which called on States participating in negotiations to establish a RFMO/A competent to regulate bottom fisheries to expedite such negotiations, the interim secretariat of NWPO prepared a draft convention text for a long-term management mechanism. Preliminary discussions of the text of the draft convention were initiated at the third intergovernmental meeting held in Honolulu, United States, in 2007. The participating States discussed potential future governance options, primarily the expansion of the current geographical scope and the fishery resources that would be

[56] http://www.fao.org/newsroom/en/news/2006/1000360/index.html.

[57] The new agreement covers the high-seas areas of the north-west Pacific Ocean, defined as those occurring within FAO Statistical Area No. 61, including all such areas and marine species other than (i) those already covered by existing international fisheries management instruments, including bilateral agreements and RFMO/As, and (ii) closed high-seas areas surrounded by the EEZ of a single country.

[58] See, New Mechanisms for Protection of Vulnerable Marine Ecosystems and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean at http://nwpbfo.nomaki.jp/index.html.

covered in the future agreement. Those discussions continued at the fourth intergovernmental meeting in Vladivostock, Russian Federation, in 2008.

144. At the fifth intergovernmental meeting, held in Tokyo in 2008, participating States agreed to expand the geographical scope of the convention and agreed, in principle, to expand the species to be covered. The new draft text, prepared by the interim secretariat, was discussed at the sixth intergovernmental meeting. Participating States agreed to expedite the negotiations, with Canada attending the meeting for the first time as a coastal State in the North Pacific.

145. It is anticipated that the negotiations will continue through 2009 and likely into 2010. The future RFMO will provide for management of bottom fisheries conducted by vessels operating on the high seas and sustainable management of fish stocks and protection of VMEs in the high-seas areas of the north-west Pacific Ocean.

146. *Adoption of interim measures*. At the second intergovernmental meeting, held in 2007, participating States adopted interim measures, as required by paragraph 85 of resolution 61/105, which were to be applicable and operational no later than 31 December 2007, unless otherwise stated. At the third intergovernmental meeting, following discussions on the implementation of the interim measures, participating States agreed to revise the measures. At the fourth intergovernmental meeting, States discussed ongoing work to fulfil their obligations under resolution 61/105, namely the establishment of science-based criteria for use in assessing whether fishing activity would have significant adverse impacts on VMEs, and the time frame for carrying out such work.

147. At the fifth intergovernmental meeting, the participating States adopted draft standards and criteria to identify VMEs and to assess impacts of bottom fisheries on such ecosystems and marine species; a working definition of corals for the Emperor Seamounts and North Hawaiian Ridge area; and observer programme standards, including information to be collected and a format for an annual report on observers. At the sixth intergovernmental meeting, participating States adopted an exploratory fisheries protocol.[59]

148. The revised interim measures set out the objectives of the sustainable management of fish stocks and the protection of VMEs, and include provisions on geographic scope, management principles, collection of fisheries and scientific information, establishment of a scientific working group, information sharing, and effective control of bottom fishing vessels. The measures limit fishing effort to the existing level and do not allow the expansion of bottom fisheries into new areas. Exceptions to the restrictions were only possible where it could be shown that any fishing activity beyond the limits or in any new areas would not have significant adverse impacts on marine species or any VME. However, such fishing activities would be subject to the exploratory fishery protocol.

149. In accordance with paragraph 83 (a) of resolution 61/105, the interim measures contain science-based criteria, consistent with the FAO International Guidelines, for

[59] Ibid., Annex 1, Science-based Standards and Criteria for Identification of VMEs and Assessment of Significant Adverse Impacts on VMEs and Marine Species (annex 2), Format of National Report Sections on Development and Implementation of Scientific Observer Programmes (annex 4), Observer Programme Draft Standards: Scientific Component (annex 5), available from http://nwpbfo.nomaki.jp/index.html.

assessing whether fishing activity would have significant adverse impacts on marine species or VMEs, and propose management measures to prevent such impacts. Regarding improving scientific research and data collection and sharing, the interim measures provide for the collection of information to facilitate the scientific work associated with the implementation of the measures. To that end, the Scientific Working Group of NWPO was working to identify and evaluate information necessary to identify VMEs as well as information necessary to assess whether bottom fishing activities would have significant adverse impacts on VMEs.[60]

150. The interim measures also provide for area closures and for encounters with VMEs, in accordance with paragraphs 83 (c) and (d) of resolution 61/105. Bottom fisheries in the area where VMEs were known or likely to occur, based on the best scientific information, would cease by 31 December 2008, unless conservation and management measures were established to prevent significant adverse impacts on VMEs.

151. Regarding VME encounters, vessels of participating States were required to cease fishing activities in any location where, in the course of normal fishing operations, cold water corals were encountered.[61] In such cases, a vessel would not resume fishing activities until it had relocated a sufficient distance, no less than five nautical miles, to reduce the likelihood of future encounters. All such encounters, including the location and the species in question, would be reported to the interim secretariat of NWPO, which would notify other participating States, so that appropriate measures could be adopted in respect of the relevant site. The exploratory fisheries protocol was established to provide guidance on conducting an exploratory fishery so as to ensure consistency with both the interim measures and resolution 61/105.

152. Consensus on management measures had yet to be reached among participating States concerning the area or areas to be closed because of the known or likely presence of VMEs;[62] the measures to be taken to promote sustainability of target fish stocks;[63] and the development a VME encounter protocol. A more detailed encounter protocol was currently under extensive discussion.[64] There were also differences of opinion as to what management measures should be introduced in response to findings of participating States on the identification of VMEs and determination of whether bottom fishing activities would cause significant adverse impacts to VMEs and the long-term sustainability of deep sea fish stocks.

153. *Implementation of interim measures*. The Republic of Korea and the Russian Federation have agreed to restrict their bottom fishing activities on the high seas of the north-west Pacific Ocean to their current levels, in order to comply with the interim measures. The Republic of Korea indicated it would deploy 100 per cent

[60] See, New Mechanisms for Protection of Vulnerable Marine Ecosystems and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean, Scientific Working Group Assessment Review Procedures for Bottom Fishing Activities (annex 3), available from http://nwpbfo.nomaki.jp/index.html.

[61] It has been tentatively agreed that cold-water corals include: *alcyonacea*, *antipatharia*, *gorgonacea*, and *scleractinia*.

[62] In the absence of consensus, some participating States have agreed among themselves to close certain areas.

[63] Principally, north Pacific armorhead and splendid alfonsino.

[64] In the absence of consensus, some participating States have decided to apply their own threshold standard.

observer coverage onboard of all its bottom trawling vessels by late 2009, for the purpose of identifying potential significant adverse impact on VMEs.

154. The Russian Federation indicated that, beside its effort within a Scientific Working Group to assess information for the designation of VMEs, it had refrained from undertaking bottom trawling in areas in which the best scientific information indicated the presence of the VME indicator species *Corallium spp*. In application of the precautionary approach, it had extended protection of VMEs to surrounding areas, by requiring fishing vessels to move at least five nautical miles from the location of these VMEs. It also planned to ban trawling on all seamount areas by the end of 2009, except for scientific and exploratory purposes, to reduce fishing for alfonsino and armorhead.

155. The United States reported that it had never participated in commercial bottom fisheries at the Emperor seamounts in the north-west Pacific ocean. However, given the fact that the EEZ of the United States was immediately adjacent to the southern end of the fishing area of concern and that the northernmost portion of the EEZ surrounding the north-western Hawaiian Islands included seamounts that were bottom-fished in the past, the United States had completed an assessment as a coastal State whose EEZ contained the same stocks of many affected species. It had also proposed that additional interim conservation and management measures for marine species and potential VME sites be adopted, including a zonal closure for the highest priority area identified as habitat for an indicator species (*Corallium*), of a seamount and a second zonal closure for the purpose of helping to rebuild the north Pacific armorhead stock.

156. The United States noted that after the review in December 2008 and February 2009 of the assessments conducted by each State and the proposed conservation and management measures, the participating States were unable to reach consensus on what management measures should be implemented by all fishing States in response to the findings. It was, therefore, up to each flag State, under the terms of resolution 61/105 to determine whether fishing would continue to be authorized beyond 31 December 2008 and, if so, any additional management measures to be adopted for such fishing activity.

157. Japan and the Republic of Korea pointed out that, in the absence of a consensus on a VME encounter protocol, they would apply their own standard based on a recommendation by NAFO in establishing its encounter protocol, which they considered an improvement over the current provision contained in the interim measure.

(b) South Pacific

158. *Status of negotiations*. Participants in the international consultations to establish the SPRFMO, a regional fisheries management organization for the conservation and management of non-highly migratory species of the high seas in the south Pacific, have been seeking to conduct their negotiations in accordance with paragraph 85 of General Assembly resolution 61/105. Seven negotiating rounds have been held to date, the first of which was held in Wellington, New Zealand, in 2006. At the third meeting, held in Reñaca, Chile, in 2007, interim measures were adopted, including measures to manage bottom fishing and control the impact of bottom fishing on VMEs.

159. Negotiations on the draft agreement have advanced and are anticipated to conclude in late 2009 or early 2010. The future RFMO was expected to provide for the conservation and management of high-seas marine living resources in the south Pacific, other than species listed in annex I of the United Nations Convention on the Law of the Sea. Establishment of the RFMO would address a governance gap in a wide area of high seas from the eastern edge of the southern Indian Ocean, across the Tasman Sea and the Pacific Ocean to the high-seas areas adjacent to the areas under national jurisdiction of South American States, where fisheries for certain straddling fish stocks and discrete high-seas fish stocks, including orange roughy, squid and mackerel, have been subject to little or no control at all.

160. In recognition of the special requirements of developing States, in particular small island developing States, participants at the third meeting were urged to provide financial, scientific and technical assistance, where available, to enhance the ability of those developing States to implement the interim measures and participate effectively in the negotiations regarding the SPRFMO draft agreement.

161. *Adoption of interim measures*. At the third meeting in 2007, participants agreed to a set of voluntary, non-legally binding, interim conservation and management measures for fisheries that were the subject of the negotiations. The interim measures were to be implemented by participants, in accordance with their laws and regulations, taking into account an ecosystem approach to fisheries management and the precautionary approach, for vessels flying their flag and fishing for non-highly migratory fish species in the high seas of the South Pacific Ocean, in order to achieve the sustainable management of fish stocks and the protection of VMEs of the area.[65]

162. As the future convention area of the SPRFMO was still under negotiation, the interim measures were to apply to the high-seas area south of the Equator, north of the CCAMLR Convention Area, east of the area covered by SIOFA, and west of the areas of fisheries jurisdictions of South American States. The interim measures were to be effective from 30 September 2007 and, unless specified otherwise, were to apply until the entry into force of the agreement under negotiation, and the adoption of conservation and management measures pursuant to that Agreement. Participants were to review the interim measures, as necessary, so that they might be revised at future meetings.

163. Among the interim measures relating to bottom fisheries, participants resolved to limit bottom fishing effort or catch to existing levels (i.e., annual average levels over the period from 1 January to 31 December 2006) in terms of the number of fishing vessels and other parameters that reflected the level of catch, fishing effort and fishing capacity; and not to expand bottom fishing activities into new regions in the high seas of the south Pacific Ocean where such fishing was not occurring. Starting in 2010, before opening new regions or expanding fishing effort or catch beyond existing levels, participants resolved to establish conservation and management measures to prevent significant adverse impacts of bottom fishing activities on VMEs and the long-term sustainability of deep-sea fish stocks, or determine that the activities would not have adverse impacts, based on assessments undertaken in accordance with the interim measures.

[65] Interim measures adopted by participants in negotiations to establish a South Pacific Regional Fisheries Management Organisation, Third International Meeting, Reñaca, Chile, 30 April-4 May (www.southpacificrfmo.org).

164. The interim measures also addressed the need for participants to cooperate in identifying, on the basis of the best available scientific information, VMEs in the area and to map sites where those ecosystems were located, and to provide such data and information to the interim secretariat of SPRFMO for circulation to all participants. In respect of areas where VMEs were known to occur or were likely to occur, based on the best available scientific information, participants resolved to close such areas to bottom fishing unless, based on an assessment undertaken in accordance with the interim measures, conservation and management measures had been established to prevent significant adverse impacts on VMEs and the long-term sustainability of deep-sea fish stocks, or it had been determined that such bottom fishing would not have significant adverse impacts on such ecosystems or the long-term sustainability of deep-sea fish stocks.

165. Regarding encounters with VMEs, participants agreed to require that vessels flying their flag would cease bottom fishing activities within five nautical miles of any site in the area where, in the course of fishing operations, evidence of VMEs was encountered, and report the encounter to the interim secretariat so that appropriate measures could be adopted in respect of the relevant site.

166. The interim measures also provided specific procedures for participants to assess, on the basis of the best available scientific information, whether individual bottom fishing activities would have significant adverse impacts on VMEs, and to ensure that if it was assessed that these activities would have significant adverse impacts, they were managed to prevent such impacts, or not authorized to proceed. In that regard, a benthic assessment framework was adopted at the fourth meeting, held in Noumea, New Caledonia, in 2007, to guide States in undertaking impact assessments, as required by the interim measures, including a process of review by other participants. Procedures were also adopted at the sixth meeting, held in Canberra, Australia, in 2008, for the collection, reporting, verification and exchange of data.[66]

167. The interim Science Working Group of SPRFMO was in the process of reviewing standards for the assessment of bottom fisheries in light of the recently approved FAO International Guidelines. The Science Working Group would address issues relating to the definition of "vulnerable marine ecosystem", the mapping of seamounts, the management and assessment of deep-sea species, and develop guidelines for annual national reports to the interim Science Working Group. It had also begun the process of assembling information on the updated database of seamounts in the area and the development of a geospatial database of joint bottom trawl footprint, seamounts and VMEs. Once adopted, the assessment standard would replace the assessment framework in the interim measures to provide participants with more detailed guidance on undertaking impact assessments.

168. At the seventh meeting, held in Lima, in 2009, participants discussed a draft bottom fishery impact assessment standard prepared by New Zealand for its vessels fishing in the high-seas areas under the competence of SPRFMO during 2008 and 2009.[67] The assessment required all vessels undertaking bottom trawling in moderately trawled areas to complete a VME evidence process form and record by-catch of 11 specified taxonomic groups recovered in any bottom trawling operation.

[66] See, Standards for the collection, reporting, verification and exchange of data, 6 October 2008, available from http://www.southpacificrfmo.org/interim-measures.

[67] Available from http://www.southpacificrfmo.org/benthic-impact-assessments/.

Threshold weights were specified for each group which, if exceeded, were allocated a "VME indicator score" based on the apparent sensitivity of each group to impact. If the total score showed evidence of a VME, the vessel was required to stop fishing, to notify the interim secretariat of SPRFMO of the location, and to move at least five nautical miles before resuming fishing.

169. *Implementation of interim measures*. In the South Pacific region, a number of the States which participated in the negotiation for the establishment of the SPRFMO have taken measures to implement the interim measures adopted by the participants. New Zealand has developed a step-wise approach to implementing the SPRFMO interim measures, with the highest priority given to bottom trawling. Initial steps focused on giving effect to the area and effort limitations specified in the interim measures, and, based on the best available scientific information, limiting bottom trawling to those areas that were most likely to have been compromised by previous bottom trawling activities. Lightly trawled areas were closed to bottom trawling. In moderately trawled areas, vessels were required to cease fishing if evidence of VMEs was encountered above established levels and move five nautical miles from the position. For heavily trawled areas, it was considered on the basis of the best available information that VMEs would have already been significantly impacted, and therefore, the "encounter provisions" of paragraph 83 of resolution 61/105 had not been applied to such areas. All vessels undertaking bottom trawling in moderately trawled areas were required to complete a VME Evidence Process form after every tow, to determine whether "evidence of a VME" had been encountered. If a vessel did encounter "evidence of a VME", it was required to stop fishing, to notify the location of the encounter, and to move at least five nautical miles before resuming fishing. In addition, all vessels were required to carry scientific observers mandated to record and report to the Ministry of Fisheries of New Zealand all benthic by-catches on a tow-by-tow basis for every tow in all areas. Such report had to be completed in addition to the VME Evidence Process form in the moderately trawled areas. Of all the States that conducted bottom fishing activities in the SPRFMO future convention area, only New Zealand had submitted an assessment, based on the best scientific evidence available, as to whether individual bottom fishing activities by its vessels would have serious adverse impacts on VMEs and the long-term sustainability of deep-sea fish stocks, in accordance with paragraph 83 (a) of resolution 61/105.

170. France indicated that it had been participating in the negotiation for the establishment of SPFRMO and had supported the adoption of interim measures to regulate bottom fisheries in the South Pacific.

171. The Republic of Korea reported that it had implemented the interim measures adopted by SPRFMO that required all fishing vessels flying the flag of participating States to be equipped with VMS, carry onboard observers and restrain fishing efforts to existing levels.

172. Peru has participated actively in negotiations for the establishment of SPRFMO, which was to address the conservation and management of straddling stocks of pelagic or deep-sea species in the high seas of the South Pacific region. The United States and Chile reported that they had not been engaged in any bottom fishing activities in the SPRFMO future convention area, but they were participating in the interim Scientific and Data Working Groups mandated to review bottom fishing activity assessments submitted by participants. Similarly, Canada was not

currently fishing in the SPRFMO area, but it shared its expertise in international fisheries governance so that gaps in the management of high-seas fishing were addressed.

5. Measures taken by States for areas where no competent RFMO/A exists

173. Several States (Australia, Cook Islands, New Zealand, Republic of Korea, Russian Federation, Spain, United Kingdom, United States) and the EC have taken measures to adopt and implement conservation and management measures in high-seas areas where there were no competent RFMO/As or no interim measures were in place, in accordance with paragraph 86 of General Assembly resolution 61/105.

174. Australia indicated that in order to comply with resolution 61/105, it had taken unilateral action to impose new conditions on vessels flying its flag operating in the area to be governed by SIOFA. Moreover, it had adopted a precautionary approach which recognized that all areas of the high seas might potentially contain VMEs, and in the absence of information to identify and assess impacts of activities on such ecosystems, management measures had been implemented for all Australia's high-seas bottom fishing effort to prevent significant adverse impacts on potential VMEs. Permit requirements for bottom fishing in the high seas include conservation and management measures to limit bottom fishing activities in the South Pacific Ocean to those areas that had already been fished by Australia between 2002 and 2006, providing protection to unidentified VMEs in unfished areas.

175. In addition, Australia had collected detailed information on fishing trips through reporting requirements, and had imposed 100-per cent observer coverage upon all vessels using demersal trawl gear, while 10-per cent observer coverage was required for vessels using other demersal fishing methods. All approved bottom fishing activities were required to cease within a radius of five nautical miles after an encounter with identified VMEs, indicated by the presence of 100 kilograms or more of coral or sponges. Further, any such encounter was required to be reported to the Australian Fisheries Management Authority to allow the adoption of appropriate measures.

176. The Cook Islands had voluntarily agreed not to register or authorize any new vessels flying its flag to enter deep-sea fisheries in the southern Indian Ocean, in the absence of an appropriate agreement that had the competence to regulate capacity and review the status of the resources. It had also mandated its vessels operating in the southern Indian Ocean to implement, inter alia, vessel data recording activities, including recording of by-catch cold-water corals and other benthos, and collect biological information. There had also been a voluntary declaration by the Government and licensed operators of a number of BPAs where fishing operations were not allowed to be carried out. The criteria for selecting BPAs were as follows: geographical extent, seabed morphology representation, and prior exposure to fishing and availability of biological data.

177. Japan noted that there were not enough research activities to determine the existence of VMEs in the SIOFA Convention Area. In addition, since its fishing vessels used bottom line fishing gear in the area, which had less impacts on VMEs than trawl fisheries, it did not consider it necessary to implement mitigation measures. Japan also stressed that, like other participants in SIOFA negotiations, it agreed to take measures to ensure the sustainable use of target species in the SIOFA Convention Area.

178. In 2008, EC adopted a regulation on the protection of VMEs in the high seas from the adverse impacts of bottom fishing gear, in areas not covered by RFMO/A measures (Council Regulation No. 734/2008). The Regulation introduced a system of special fishing permits issued by EC member States if specific conditions for issuance, including the submission of a detailed fishing plan, have been met by applicants. The competent authorities would grant special fishing permits after they had carried out assessments of the potential impacts of the intended fishing activities and concluded that such activities were not likely to have significant adverse impacts on VMEs. The use of bottom fishing gear was prohibited in areas where no proper scientific assessments had been conducted. The Regulation also contained provisions on unforeseen encounters with VMEs, area closures and an observer scheme for all vessels that have been issued a special fishing permit. The south-west Atlantic Ocean, where no RFMO/A was competent to regulate bottom fisheries, and the southern Indian Ocean, where no interim measures had been adopted within SIOFA by 31 December 2008, were the main areas addressed by the regulation. EC was in the process of assessing the first reports on how the regulation had been implemented.

179. Spain reported that it had conducted marine scientific research in high-seas areas of the south-west Atlantic where its vessels conducted bottom trawling, with a view to mapping and identifying VMEs. The results of the research would be made public at the end of 2009 and would serve as a basis for determining the areas to be protected. Pending the presentation of the results of the investigation, a mitigating measure restricting fishing activities to the area where fisheries took place in the past (historical footprint) was adopted, in accordance with General Assembly resolution 61/105. It had also established mandatory rules to be followed by its vessels in the event of encounters with VMEs. Portugal reported that it had not issued any fishing permits to vessels flying its flag for areas beyond national jurisdiction where there was no RFMO/A.

180. The United Kingdom reported that fishing vessels flying its flag were allowed to conduct bottom trawling operations on the high seas of the south-west Atlantic, only if they had a fishing licence. Licence conditions included the obligation to ensure compliance with conservation measures, the restriction of bottom trawling to those areas previous trawled for the last 40 to 50 years, the use of a functioning VMS, the requirement of full catch data, and the obligation to carry an observer and avoid areas containing deep-water corals. In addition, no new deep-water areas were allowed to be fished without an environmental impact assessment.

181. The Republic of Korea reported that it had also been conducting bottom fisheries in the south-west Atlantic and, in accordance with resolution 61/105, it had initiated discussion with relevant countries for the adoption of proper conservation and management regime for the area. It had organized several workshops for bottom fishing industries to raise awareness of the importance of protecting VMEs. In application of the precautionary approach, in December 2008, the fishing authorities of the Republic of Korea issued an Administrative Directive for Implementing International Regulation regarding Bottom Fishing in the High Seas to regulate bottom fishing activities in areas where there was no RFMO/A or process for the establishment of such an organization or arrangement. The Directive provided a definition of VMEs, significant adverse impacts and bottom fishing, and required vessels to report and relocate when encountering VMEs, as well as to install VMS. In 2009, additional elements were included in the directive, now published as

Regulation No. 2009-27, such as the issuance of separate fishing licences for bottom fisheries on the high seas based on an assessment of potential impacts of fishing activities, and a requirement for relocation to an alternative site at a minimum distance of one mile from the site of any encounter with VMEs.

182. The United States reported that no vessels flying its flag were authorized to conduct bottom fisheries in areas beyond national jurisdiction. In 2005, it had decided that, as a matter of policy, the United States would not issue new permits for vessels to fish on seamounts on the high seas until consultations required under its National Environmental Policy Act and Endangered Species Act were held. Domestic legislation was being updated to reflect that policy. In particular, the Magnuson-Stevens Conservation and Management Act, as amended in 2007, qualified as illegal, unreported and unregulated fishing, activities that had adverse impacts on seamounts, hydrothermal vents, and cold-water corals located beyond national jurisdiction, for which there were no applicable RFMO/A conservation measures.

183. New Zealand stated that the only vessels flying its flag authorized to undertake bottom fishing activities in areas beyond national jurisdiction were those conducting such fishing in areas where conservation and management measures had been adopted and implemented pursuant to paragraphs 83 or 85 of resolution 61/105, namely, the CCAMLR Convention Area and the high-seas areas subject to SPRFMO interim measures.

184. In addition to its effort to implement measures to regulate bottom fisheries in the North Atlantic, the Russian Federation reported that it planned to research areas with VMEs in the Barents Sea with a view to developing measures to protect such ecosystems from bottom fisheries.

C. Actions taken by States and competent regional fisheries management organizations and arrangements to make adopted measures publicly available

1. Publicity of measures adopted by competent RFMO/As

185. In paragraph 84 of its resolution 61/105, the General Assembly called upon RFMO/As with the competence to regulate bottom fisheries to make the measures adopted pursuant to paragraph 83 of the resolution publicly available. The following RFMOs maintained websites that detailed and publicized their conservation and management measures:

- NAFO maintained a public website on which it published all adopted documents and reports including the NAFO Conservation and Enforcement Measures (www.nafo.int)
- NEAFC had a public website on which it published all relevant documents, including those related to bottom fishing and vulnerable marine ecosystems (www.neafc.org)
- SEAFO maintained a website with details on conservation and management measures that have been adopted on bottom fishing activities (www.seafo.org)

- CCAMLR had a website with detailed descriptions of conservation measures implemented. The CCAMLR secretariat annually compiled a list of vessels authorized to fish pursuant to the adopted conservation measures, which was made public on CCAMLR's website (www.ccamlr.org).

2. Publicity of measures adopted by States

186. In paragraph 85 of its resolution 61/105, the General Assembly called upon States to make interim measures adopted in accordance with the resolution publicly available. In paragraph 87 of the resolution, the Assembly also called upon States to make publicly available through FAO a list of those vessels flying their flag authorized to conduct bottom fisheries in areas beyond national jurisdiction, and the measures they had adopted pursuant to paragraph 86 of the resolution. In this regard, the United States and the EC indicated that they strongly supported transparency and the publication of measures as called for in General Assembly resolution 61/105, as this was necessary to evaluate the efficiency of the framework adopted under the resolution.

(a) Publicity of interim measures

187. In accordance with paragraph 85 of resolution 61/105, the interim secretariats of SPRFMO and NWPO maintained websites which publicized the interim measures that had been adopted (www.southpacificrfmo.org and http://nwpbfo.nomaki.jp/index.html). Australia, the EC and the Republic of Korea also reported that their measures adopted pursuant to paragraph 86 of the resolution had been published in official publications.

(b) Publicity of measures through FAO

188. Several States reported on their actions taken in accordance with paragraph 87 of resolution 61/105 (Australia, Cook Islands, New Zealand, Republic of Korea, United States). Australia reported that, once confidentiality issues arising under national law were addressed, it hoped to provide a list of vessels authorized to conduct bottom fisheries in areas beyond national jurisdiction to FAO. In the interim, a list has been compiled of all relevant fishing trips taken by Australian flagged vessels. The Cook Islands reported that all information referred to in paragraph 87 of the resolution had been conveyed to FAO. Cuba has compiled a list of vessels that sailed under the Cuban flag and were conducting fishing activities in waters under Mexican jurisdiction, in accordance with a bilateral agreement signed by the two States on 26 July 1976.

189. New Zealand's high seas register, which was publicly available, recorded the details of all New Zealand flagged vessels permitted to fish in areas beyond national jurisdiction. New Zealand was compiling a list for submission to FAO of its flagged vessels that were issued high seas permits to undertake bottom fishing in 2008 and 2009. The United States reported that none of its flagged vessels were authorized to conduct bottom fisheries in areas beyond national jurisdiction. It indicated that the requirements for vessels operating in certain areas within national jurisdiction were available on the Internet.

IV. Activities of the Food and Agriculture Organization of the United Nations to promote the regulation of bottom fisheries and the protection of vulnerable marine ecosystems

190. Paragraph 88 of General Assembly resolution 61/105 emphasized the critical role played by FAO in providing expert technical advice, in assisting with international fisheries policy development and management standards, and in collection and dissemination of information on fisheries-related issues, including the protection of vulnerable marine ecosystems from the impacts of fishing. Paragraph 90 of the resolution further invited FAO to consider creating a global database of information on VMEs in areas beyond national jurisdiction to assist States in assessing any impacts of bottom fisheries on such ecosystems and invited States and RFMO/As to submit information to any such database on all VMEs identified in accordance with paragraph 83 of the resolution.

191. The FAO Code of Conduct for Responsible Fisheries and the subsequent FAO Technical Guidelines for Responsible Fisheries, provide a useful framework for considering the impacts of potentially destructive fishing practices on VMEs.[68] In addition, FAO has undertaken a series of activities and organized workshops in order to gain an overview of information necessary for the development of international guidelines for the management of deep-sea fisheries in the high seas. Together with these activities, FAO has over the last two years, undertaken a major review of deep-sea fisheries in the high seas. The report entitled *Worldwide Review of Bottom Fisheries in the High Seas* presented the "current picture" of high seas bottom fisheries. The report was prepared by reviewing data from the 2003 to 2006 period, and would be updated on a continuous basis.[69]

192. FAO has also been collaborating with other relevant organizations and agencies with regard to both fisheries issues and the protection of marine biodiversity, including through the FAO Fishery Resources Monitoring System. A website has been established that provided a comprehensive, one-stop source of information on world fishery resources (http://firms.fao.org/firms/en), including data on catches, fishing fleet activities, stock levels and management practices.

193. FAO has maintained a list of authorized vessels engaging in high seas fisheries, in accordance with the Compliance Agreement. The list only covered those vessels under the flags of the parties to the Compliance Agreement (currently 38 States and EC), and information regarding specified gears, operating areas and main species targeted (e.g., deep-sea bottom trawl or tuna purse seine) was not usually included. Data in the list was often out of date owing to the lack of or late responses, and were not publicly available. The global list of fishing vessels currently under consideration was aimed at resolving those deficiencies. The FAO report *Worldwide Review of Bottom Fisheries in the High Seas* contained a detailed analysis of the fleets involved in these fisheries worldwide as reported to FAO in a questionnaire distributed to States with vessels operating in the high seas.

[68] FAO, The Ecosystem Approach to Fisheries: FAO Technical Guidelines for Responsible Fisheries, No. 4, Supp. 2 (Rome, 2003).

[69] *Worldwide Review of Bottom Fisheries in the High Seas*, FAO Fisheries and Aquaculture Technical Paper, No. 522, 2008.

A. Development of the International Guidelines for the Management of Deep-sea Fisheries in the High Seas

194. The FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas were developed at the request of the FAO Committee on Fisheries (COFI), at its twenty-seventh session in March 2007.[70] Following a process involving expert consultations and workshops, a FAO Technical Consultation finalized and adopted the International Guidelines in August 2008.[1] The International Guidelines contained standards and criteria for identifying VMEs beyond areas under national jurisdiction and the impacts of fishing activities on such ecosystems, in order to facilitate the adoption and implementation of conservation and management measures by RFMO/As and flag States, pursuant to paragraphs 83 and 86 of General Assembly resolution 61/105. With regard to the identification of VMEs, the FAO International Guidelines indicated that a marine ecosystem should be classified as vulnerable based on the characteristics it possesses. In this respect, the FAO International Guidelines provided the following list of characteristics to be used as criteria in the identification of VMEs: (a) uniqueness or rarity; (b) functional significance of the habitat; (c) fragility; (d) life-history traits of component species that make recovery difficult; and (e) structural complexity.[71]

195. Following the adoption of the International Guidelines, FAO developed a programme proposal for future activities on deep-sea fisheries in the high seas, which had four main components: (a) support tools for the implementation of the FAO International Guidelines; (b) a VME database; (c) support for management activities in areas without RFMO/A regulation; and (d) global coordination, monitoring and evaluation and dissemination of information.[72] The proposed programme received considerable support when it was presented to FAO members at the twenty-eighth session of the FAO COFI held March 2009. Initial activities were scheduled to commence in August 2009. However, most of the financial support necessary to pursue the programme still needed to be mobilized.

196. In their submissions to the present report, several States (Canada, France, New Zealand, Republic of Korea, Russian Federation, United States) and EC welcomed the adoption of the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas. They expressed their readiness to actively engage in the FAO programme for the implementation of the International Guidelines and endeavoured to collect available scientific information and take other necessary actions for this purpose. They also stressed their support for the critical role of FAO in addressing the issue of deep-sea fisheries, including by actively participating in meetings, consultations, workshops and actions in the development of the FAO International Guidelines. States indicated that the FAO International Guidelines had great importance, as they provided tangible direction to fisheries managers and operators in the protection of VMEs against the effects of fishing, by further detailing key concepts in General Assembly resolution 61/105, such as the definition of "vulnerable marine ecosystem", the components of an "assessment", and examples of mitigation measures.

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[70] FAO Fisheries Report No. 830.

[71] Report of the Technical Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas, Rome, 4-8 February and 25-29 August 2008, annex F.

[72] FAO document COFI/2009/5/Rev.1.

B. Development of a global database of information on vulnerable marine ecosystems beyond national jurisdiction

197. At its twenty-seventh session, COFI agreed that FAO should follow the request in paragraph 90 of resolution 61/105 to create a global database on VMEs in areas beyond national jurisdiction, in cooperation with other relevant organizations, such as the International Union for Conservation of Nature.[70]

198. FAO reported that initial work supporting the creation of a global database on VMEs in areas beyond national jurisdiction had been undertaken in the current project dealing with deep-sea fisheries, though such a database was not part of the original project activities. A definition of a "vulnerable marine ecosystem" was developed through a workshop and then further developed and adopted at the Technical Consultation for the Management of Deep-sea Fisheries in the High Seas.[1] It had also been working on the development of a large project to assist with the implementation of the FAO International Guidelines. The development of a VME database was an important component of this project. Furthermore, FAO was collaborating with other relevant organizations and agencies with regard to both fisheries and the protection of marine biodiversity, including the Convention on Biological Diversity.

199. In their contributions, States expressed appreciation for the role of FAO in providing assistance in the management of deep-sea fisheries in the high seas and the protection of VMEs, including through the series of actions outlined in paragraph 89 of the resolution. It was suggested that FAO should continue its work on biodiversity mapping, as it would contribute to the implementation of the ecosystem approach to fisheries management, and also follow the request in paragraph 87 of the resolution to create a list of authorized vessels engaged in high seas deep-sea fisheries.

V. Concluding remarks

200. The international community has responded to the call for action in General Assembly resolution 61/105 and a wide range of measures have been adopted to address the impacts of bottom fishing on vulnerable marine ecosystems, both in areas within and beyond national jurisdiction, including closing areas to fishing, developing tools to identify VMEs, prohibiting certain fishing practices in areas with VMEs, restricting gear types and use, collecting data and conducting research, establishing MPAs in areas within national jurisdiction, and more comprehensive and rigorous use of scientific advice.

201. Despite progress, the implementation of the resolution has been uneven and further efforts are needed in this regard, including through the adoption and implementation of conservation and management measures to address the impacts of bottom fishing activities on VMEs. In particular, further efforts are needed to expedite negotiations to establish new RFMO/As competent to regulate bottom fisheries, in order to close the gap in high seas fisheries governance. Pending the establishment of these RFMO/As, all States conducting bottom fishing operations in future convention areas should strive to implement the interim measures adopted by States participating in these negotiations. Flag States whose vessels are conducting fishing activities in areas of the high seas where no RFMO/A exists should also

adopt and implement conservation and management measures for these areas, in respect of their flagged vessels, pursuant to paragraph 86 of the resolution.

202. Protecting VMEs from bottom fishing activities is an ongoing process and additional actions may be needed when new information has been acquired and developed. Important in this respect will be the development of support tools, including a global database on VMEs, as many countries lack the capacity to identify VMEs and assess whether individual bottom fishing activities have significant adverse impacts.

203. More broadly, further efforts are needed to increase cooperation and coordination on data collection and sharing, and for capacity-building and transfer of appropriate technology to developing States to ensure their participation in deep sea fisheries and the protection of VMEs.

Annex

List of respondents to the questionnaire

States and entities

Australia

Benin

Brazil

Canada

Chile

Chad

Cook Islands

Croatia

Cuba

European Community

France

Iraq

Japan

Kuwait

Lithuania

New Zealand

Norway

Oman

Peru

Qatar

Republic of Korea

Russian Federation

Senegal

Seychelles

Slovakia

Suriname

United Kingdom of Great Britain and Northern Ireland

United States of America

Venezuela (Bolivarian Republic of)

Yemen

United Nations agencies, programmes and funds, and related organizations

Division for Sustainable Development of the Department of Economic and Social Affairs

Food and Agriculture Organization of the United Nations

World Trade Organization

Other intergovernmental organizations

Association of Southeast Asian Nations

Intergovernmental Oceanographic Commission/United Nations Educational, Scientific and Cultural Organization

International Union for the Conservation of Nature and Natural Resources

World Bank

Regional fisheries management organizations and arrangements

Commission for the Conservation of Antarctic Marine Living Resources

Commission for the Conservation of Southern Bluefin Tuna

Interim secretariat of Management of High-Seas Bottom Fisheries in the North Western Pacific Ocean

Interim secretariat of the South Pacific Regional Fisheries Management Organization

Inter-American Tropical Tuna Commission

Northwest Atlantic Fisheries Organization

North Atlantic Salmon Conservation Organization

North East Atlantic Fisheries Commission

Pacific Islands Forum Fisheries Agency

South East Atlantic Fisheries Organization

Secretariat of the Pacific Community

Non-governmental organizations

Deep Sea Conservation Coalition

National Fisheries Institute

Wildlife Conservation Society